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TRANSACTIONS OF THE ILLINOIS STATE ACADEMY OF SCIENCE

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80th Annual Meeting

April 10–12, 1987

EASTERN ILLINOIS UNIVERSITY
Charleston, Illinois

$2.00

PROGRAM AND ABSTRACTS

of the

ILLINOIS STATE ACADEMY OF SCIENCE

80TH ANNUAL MEETING

ENDANGERED SPECIES

EASTERN ILLINOIS UNIVERSITY

CHARLESTON, ILLINOIS

APRIL 10-12, 1987

held in conjunction with

THE ANIMAL BEHAVIOR SOCIETY

1987 MIDWEST REGIONAL MEETING

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ILLINOIS STATE ACADEMY OF SCIENCE
80TH ANNUAL MEETING

in conjunction with

THE ANIMAL BEHAVIOR SOCIETY
1987 MIDWEST REGIONAL MEETING

EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS
10-12 APRIL 1987

REGISTRATION

Participants are urged to preregister for the ISAS Annual Meeting by returning the enclosed Registration Form with a payment of $8.00 to the Treasurer. The deadline for receipt of preregistration is Friday, 3 April 1987. Tickets and name tags of preregistrants can be picked up at the Registration Table outside the Grand Ballroom of the Eastern Illinois Union at the time of the meeting.

On-site registration will be conducted during the meeting. On-site registration fee is $10.00.

Participants must register and have their ISAS name tag before they can participate in the ISAS meeting activities.

ACCOMMODATIONS

Camping: Primitive campsites are available at Fox Ridge State Park located about 7 miles south of Charleston on route 130. The cost is $3.00 per night per campsite.

Motels: Reservations should be made by 25 March 1987.

		single	double
Charleston Motor Inn*	(217) 348-8161	32.00	40.00
Lincoln Ave (Rt. 16), Charleston			
College Inn Motel	(217) 345-3935	26.64	31.08
Lincoln Ave (Rt. 16), Charleston			
Mattoon Holiday Inn	(217) 235-0313	45.00	55.00
East Rt. 16, Mattoon			
Quality Inn	(217) 235-4161	30.99	34.90
South Rt. 45 and I-57, Mattoon			

*A block of rooms has been reserved at the Charleston Motor Inn for meeting participants. Call (800) 252-2139 or (217) 348-8161 to make your reservations. This block of rooms will be released to the public on March 25th.

PARKING

Some parking spaces are available on a first come basis for about $3.00 for the entire day at the University Union. Unlimited parking is available at O'Brien Stadium about 3 blocks west of the University Union. On Friday do not park in any other campus lot as your car will probably be towed. On Saturday all campus lots are available at no cost.

FOOD

Food service is available on the EIU campus only in the University Union where there is a fast food restaurant. Numerous restaurants and fast food establishments are within easy walking distance from campus. A list of restaurants will be provided at the Registration Table.

ISAS Luncheon: Friday, 10 April 1987, 12 noon, in the University Union Grand Ballroom. This will be a luncheon buffet and will be followed by a public lecture presented by Dr. Robert H. Mohlenbrock, Southern Illinois University. Tickets, $8.00 each, must be purchased by preregistration.

Barbeque: Friday, 10 April 1987, 6:30 p.m. on the lawn to the north of the H. F. Thut Greenhouse, following a Wine and Cheese Social Hour in the Grand Ballroom of the University Union. Tickets for the barbeque, $10.00 each, must be purchased by preregistration. For those who do not want pork, other meat will be available.

TRAVEL INFORMATION

Eastern Illinois University, Charleston, Illinois, is located about 50 miles south of Champaign/Urbana. For those arriving by car Charleston is located in east-central Illinois about 8 miles east of I-57 on route 16. Charleston is served by the Coles County Airport, located about 7 miles from campus. Since convenient commercial transportation is not available from the airport, air travelers should make arrangements in advance by calling John Ebinger at (217) 581-3525.

SPOUSE'S ACTIVITIES

No organized activities are planned for the meeting, but there are a number of sites of local interest that may be visited. A calendar of events will be available at the Registration Table.

OPTIONAL POST MEETING FIELD TRIPS

Two field trips have been arranged for Saturday, 11 April 1987. Participants should sign up at the Registration Table on Friday for the optional field trips. Directions and other information will be available at that time.

Local Natural Area Field Trip: The trip will include a tour of Rocky Branch Nature Preserve, an area of sandstone cliffs and good quality beech-maple-oak forests. Spring flowers should be out for this trip. The trip will start at 1:00 p.m. at the University Union.

Earth Science Field Trip: An Earth Science field trip will visit several sites in the local area. The relationship between Pennsylvanian age bedrock and the overlying glacial material will be examined. Also, the group will stop at Lake Charleston, where reconstruction has begun on the spillway that collapsed in November, 1985. The trip will start at 1:00 p. m. at the University Union.

CANCELLATION POLICY

A full refund will be made if you cancel by noon, 3 April 1987.

ISAS BARBEQUE

A pork barbeque will be held on the campus lawn just north of the H. F. Thut Greenhouse, 300 yards south of the University Union. Before and during the barbeque, participants may tour the greenhouse, the wild flower and azalea gardens, and the Life Science Building. The barbeque will start at 6:30 p.m., Friday, April 10th, and will be followed at 7:45 p.m. by the annual ISAS Business Meeting which will be held in the Grand Ballroom of the University Union.

April weather in central Illinois is unpredictable. Usually the day time temperatures are moderate, and the evenings are cool. Also, rain is common. It is recommended that you dress accordingly.

DEMONSTRATION/POSTER SESSION

Most of the 15 posters will be available for viewing during the Wine and Cheese Social, 5:15 to 6:15 p.m., 10 April, in the University Union Grand Ballroom. Some may also be viewed in the reception area on the third floor of the University Union during the Saturday paper session. Abstracts of the demonstration/poster session are listed after the paper session abstracts in the program.

SYMPOSIA

Endangered Species Symposium: Susan E. Lauzon, Coordinator, Endangered Species Protection Board, Illinois Department of Conservation, will be moderator. Participants will present their research results on Illinois endangered species.

Symposium on Invertebrates: Dr. Robert J. Wolff, Department of Biology, Trinity Christian College, will be moderator. Current research on most groups of invertebrates of the central United States will be presented.

KEYNOTE SPEAKERS

Dr. Willard D. Klimstra is a Distinguished Professor and Director of the Cooperative Wildlife Research Laboratory, Southern Illinois University at Carbondale. He received his Ph.D. in 1948 from Iowa State University. His research interests are in land and water reclamation following mining, the impact of land use on native fauna and flora, and endangered habitats and species. Dr. Klimstra participated in the development and passage of state legislation resulting in the Illinois Nature Preserves System and in the Endangered Species Program, and is presently a member of the Illinois Endangered Species Board. The title of his address is: Endangered Species Management: Some Philosophical Aspects. GRAND BALLROOM, Friday, 10 April 1987, 8:30 p.m.

Dr. Robert H. Mohlenbrock is a Distinguished Professor and AMOCO Outstanding Teacher at Southern Illinois University, Carbondale. His research interests are the flora of mid-western United States and endangered habitat and species. Dr. Mohlenbrock is presently chairman of the North American Plant Specialists Group of the Species Survival Commission of the International Union for the Conservation of Nature, and is on the Board of Directors of the Center for Plant Conservation. He has published 32 books and numerous articles on the flora of the midwest and endangered species, and is presently a monthly columnist for Natural History magazine. The tile of his address is: Where Have All The Wild Flowers Gone? GRAND BALLROOM, Friday, 10 April 1987, 1:00 p.m.

Dr. Robert L. Smith received his Ph.D. in 1975 from Arizona State University. His research interests are in the area of behavioral ecology of insects and he is particularly interested in the evolution of paternal care and sex-role reversal, and he has published seminal papers in these areas. Dr. Smith has studied throughout the U. S., in Mexico, and in Argentina, and is currently a faculty member in the Department of Entomology at the University of Arizona. His address will be presented after the Animal Behavior Conference banquet. GRAND BALLROOM, Saturday, 11 April 1987, 8:30 p.m.

SUMMARY OF EVENTS

FRIDAY, April 10, 1987

8:30 a.m. - 4:00 p.m.	Registration-University Union
9:00 a.m. - 11:45 a.m.	Paper Sessions* (See Program)
12:00 Noon - 1:00 p.m.	Luncheon Buffet** - University Union Grand Ballroom
1:00 p.m. - 1:45 p.m.	Public Lecture-University Union Grand Ballroom SPEAKER: Dr. Robert H. Mohlenbrock "Where Have All The Wild Flowers Gone?"
2:00 p.m. - 5:00 p.m.	Paper Sessions* (See Program)
5:15 p.m. - 6:15 p.m.	Wine and Cheese Social Hour and Demonstration/Poster Session University Union Grand Ballroom
6:30 p.m. - 7:30 p.m.	Barbeque** North of Thut Greenhouse
7:45 p.m. - 8:15 p.m.	ISAS Business Meeting University Union Grand Ballroom
8:30 p.m. - 9:30 p.m.	General Session - Open to the Public, University Union Grand Ballroom SPEAKER: Dr. W. D. Klimstra "Endangered Species Management: Some Philosophical Aspects"

SATURDAY, April 11, 1987

8:00 a.m. - 10:00 a.m.	Registration - University Union
8:30 a.m. - 12:00 Noon	Paper Sessions* (See Program)
Afternoon	Post Meeting Field Trips

* ALL PAPER SESSIONS WILL BE HELD ON THE THIRD FLOOR OF THE UNIVERSITY UNION.

** Luncheon and barbeque tickets should be reserved at pre-registration and will be issued at the registration desk; they will not be mailed. A limited number only will be available at the registration desk for registrants at the meeting.

THE ANIMAL BEHAVIOR CONFERENCE

The 1987 Midwest Regional Animal Behavior Conference is sponsored by the Department of Zoology of Eastern Illinois University. The meeting is intended to provide a forum for the exchange of current research on all aspects of animal behavior through the presentation of research results and informal discussion with colleagues. The meeting will include sessions of contributed papers, a poster session, and a keynote address by Dr. Robert L. Smith of the University of Arizona. The Animal Behavior Conference will hold paper sessions on Saturday morning and afternoon, 11 April, and on Sunday morning, 12 April. Care has been taken to avoid overlap between related ISAS and ABS sessions. ISAS Registrants may attend all ABS functions. For more information about the Animal Behavior Conference contact:

Dr. Kipp C. Kruse
Department of Zoology
Eastern Illinois University
Charleston, Illinois 61920
(217) 581-3363

ANIMAL BEHAVIOR CONFERENCE PROGRAM

FRIDAY, 10 April 1987

7:00-9:00 p.m.	Registration - University Ballroom
8:00-10:00 p.m.	Wine and Cheese Reception - University Ballroom

SATURDAY, 11 April 1987

8:00-10:00 a.m.	Registration - 3rd Floor Lobby University Union
9:00-Noon	Paper Session - Charleston/Mattoon Room, University Union
12:00-1:30 p.m.	Lunch - Grand Ballroom
1:30-4:30 p.m.	Paper Session - Charleston/Mattoon Room, University Union
1:30-3:00 p.m.	Poster Session - Effingham Room, University Union
6:00-7:00 p.m.	Social Hour - 1985 Room
7:00 p.m.	Banquet and Keynote Address Dr. Robert L. Smith, University of Arizona

SUNDAY, 12 April 1987

9:00-Noon	Paper Session - Charleston/Mattoon Room, University Union

AGRICULTURE DIVISION

DIVISION CHAIR:
Teresa Lynn North
Department of Agriculture
Western Illinois University
Macomb, Illinois 61455

ROOM: Oakland

SESSION I - Friday, April 10

PRESIDING: Teresa North

TIME	PAPER #	
9:00 AM		BUSINESS MEETING
9:15 AM	1	EFFECT OF ZERANOL IMPLANTATION ON WEANING WEIGHT FOR SUCKLING BEEF CALVES. T. L. North and M. F. Zumer, Western Illinois University, Macomb.
9:30 AM	2	EFFICIENCY COMPARISON BETWEEN BULLS, SHORT SCROTUM BULLS AND STEERS. P. M. Walker, M. Messman, and B. E. Hallbauer, Illinois State University, Normal.
9:45 AM	3	EFFICIENCY COMPARISON OF TWO BIOLOGICAL TYPES OF COWS, MEDIUM FRAME HEREFORD-ANGUS CROSS AND LARGE FRAME CHIANINA-ANGUS CROSS, PHASE I AND II PROGRESS REPORT. P. M. Walker, M. Messman, and A. Prill, Illinois State University, Normal.
10:00 AM	4	AEROBIC WASTE DISPOSAL IN A MODIFIED SOIL FILTER. P. M. Walker and M. Messman, Illinois State University, Normal.
10:15 AM		BREAK
10:30 AM	5	ESTROUS SYNCHRONIZATION IN GILTS WITH THE AID OF PROSTAGLANDINS. D. Walker and S. Webel, Illinois State University, Normal.
10:45 AM	6	SUPEROVULATORY RESPONSE OF DONOR COWS. C. L. Moore, A. Abjean-Uguen, and S. Mevel, Illinois State University, Normal.
11:00 AM	7	A SURVEY OF EMBRYO TRANSFER USE BY ILLINOIS ANGUS BREEDERS AND SELECTED AMERICAN ANGUS BREEDERS. P. M. Walker, J. R. Winter, and K. Reeser, Illinois State University, Normal.

11:15 AM 8 COMPARING METHODS OF FREEZING AND THAWING MOUSE EMBRYOS. C. L. Moore and K. Kreier. Illinois State University, Normal.

ROOM: Oakland

SESSION II - Friday, April 10 PRESIDING: Teresa North

2:15 PM 9 PROBLEMS IN THE OIL PATCH: THE EFFECTS OF THE DECLINE IN OIL PRICES IN ILLINOIS BASIN PRODUCTION. K. Harris, Southern Illinois University, Carbondale.

2:30 PM 10 CHANGES IN THE USE OF MARGINAL AGRICULTURAL LAND IN SOUTHERN ILLINOIS: 1980 TO 1986. W. M. Herr, S. E. Kraft, and S. Sundaram, Southern Illinois University, Carbondale.

2:45 PM 11 AN APPLICATION OF THE FARMING SYSTEMS METHODOLOGY IN SOUTHERN ILLINOIS. S. E. Kraft, T. Purcell, P. L. Roth, B. H. Taylor, and A. Thielen, Southern Illinois University, Carbondale.

3:00 PM 12 THE CONSERVATION RESERVE PROGRAM IN ILLINOIS: BIDDING ACTIVITY AMONG ILLINOIS COUNTIES. M. P. Curry, Southern Illinois University, Carbondale, J. D. Esseks, Northern Illinois University, DeKalb, and S. E. Kraft, Southern Illinois University, Carbondale.

3:15 PM 13 THE 1985 FARM LEGISLATION, ADJUSTMENTS IN LOAN RATES: IMPACT UPON NET FARM INCOME. A. Kerber and J. Beaulieu, Southern Illinois University, Carbondale.

BOTANY DIVISION

DIVISION CHAIR:
David Seigler
Department of Plant Biology
University of Illinois
Urbana, Illinois 61801

ROOM: Effingham

SESSION I - Friday, April 10

PRESIDING: David Seigler

TIME	PAPER #	
2:00 PM	14	CYANOGENESIS IN ILLINOIS MEMBERS OF THE ROSACEAE AND RANUNCULACEAE. K. E. Aikman and J. E. Ebinger, Eastern Illinois University, Charleston.
2:15 PM	15	CYANOGENESIS IN THE UMBILICATE LICHEN DERMATOCARPON MINIATUM (L.) MANN. D. L. Bergman and J. E. Ebinger, Eastern Illinois University, Charleston.
2:30 PM	16	THE IMPORTANCE OF GUILDS IN THE ESTABLISHMENT OF PLANT COMMUNITY STRUCTURE IN FIRST YEAR SUCCESSIONAL PLOTS. M. E. Fishbein, T. P. Simon, D. M. Jedlicka, and N. B. Hunter, University of Illinois-Chicago.
2:45 PM	17	VEGETATIVE REGENERATION OF TWO MOSSES IN A GRAMINOID COMMUNITY SUBSEQUENT TO BURNING. J. R. Rastorfer, Chicago State University, Chicago.
3:00 PM	18	PATTERNS OF SUCCESSION IN URBAN WEED LOTS. N. B. Hunter, T. P. Simon, D. M. Jedlicka, and M. E. Fishbein, University of Illinois-Chicago.
3:15 PM	19	PATTERNS OF SPECIES REPLACEMENT AND DOMINANCE IN CHICAGO URBAN WEED SUCCESSION. T. P. Simon, D. M. Jedlicka, N. B. Hunter, and M. E. Fishbein. University of Illinois-Chicago.
3:30 PM		BREAK
3:45 PM	20	EDGE EFFECT: URBAN WEEDS VERSUS LAWN. D. M. Jedlicka, T. P. Simon, N. B. Hunter, and M. E. Fishbein. University of Illinois-Chicago.
4:00 PM	21	AN UNDERSTORY SURVEY OF BABER WOODS, EDGAR COUNTY, ILLINOIS. A. J. Burns and J. E. Ebinger, Eastern Illinois University, Charleston.

4:15 PM 22 WOODY UNDERSTORY OF BABER WOODS, EDGAR COUNTY, ILLINOIS. J. M. Spencer and J. E. Ebinger, Eastern Illinois University, Charleston.

4:30 PM 23 A NEW STOMATAL TYPE AMONG VASCULAR PLANTS. B. M. Stidd, Western Illinois University, Macomb.

ROOM: Effingham

SESSION II - Saturday, April 11 PRESIDING: David Seigler

TIME PAPER #

9:00 AM 24 LATITUDINAL VARIATION IN EASTERN COTTONWOOD. P. A. O'Connor and J. J. Jokela, University of Illinois, Urbana.

9:15 AM 25 GEOGRAPHIC VARIATION IN QUERCUS RUBRA L. B. G. McMahon and J. J. Jokela, University of Illinois, Urbana.

9:30 AM 26 INVESTIGATION OF THE REPRODUCTIVE BIOLOGY OF HYMENOXYS ACAULIS VAR. GLABRA: IMPLICATIONS FOR CONSERVATION AND MANAGEMENT. M. M. DeMauro, University of Illinois-Chicago.

9:45 AM 27 DIFFERENCES IN THE DROP TIMES OF PROPAGULES OF LIATRIS ASPERA AMONG PRAIRIE, SAVANNA, AND DUNE SUBPOPULATIONS. L. Mule, University of Illinois-Chicago.

10:00 AM 28 HUDSONIA TOMENTOSA: AN ENDANGERED PLANT'S RESPONSE TO FIRE. R. W. Nyboer, Illinois Department of Conservation, Sterling.

10:15 AM 29 A FLORISTIC SURVEY OF THE VASCULAR PLANTS OF SPRING LAKE PARK AND ADJACENT AREA, MCDONOUGH COUNTY, ILLINOIS. C. K. Wirmum, Western Illinois University, Macomb.

10:30 AM 30 THE EFFECT OF INFECTION BY ERYSIPHE GRAMINIS f. sp. HORDEI CULTURE CR3 ON HOST-NUCLEAR PROTEINS AND NUCLEIC ACIDS IN ISOGENIC LINES OF RESISTANT AND SUSCEPTIBLE BARLEY COLEOPTILE. P. K. Bhattacharya, Indiana University Northwest, Gary, IN.

10:45 AM BUSINESS MEETING

CHEMISTRY/COLLEGIATE CHEMISTRY DIVISION

DIVISION CHAIR:
Fred Breitbeill III
Department of Chemistry
DePaul University
Chicago, Illinois 60614

ROOM: Greenup

SESSION I - Friday, April 10

PRESIDING: Fred Breitbeill

TIME	PAPER #	
9:00 AM	31	AN ENZYME METHOD FOR THE SPECTROPHOTOMETRIC DETERMINATION OF MICRO AMOUNTS OF CYANIDE. T. Fonong, Illinois State University, Normal.
9:20 AM	32	BIOCHEMICAL FUNCTIONS OF VARIOUS POLYAMINES: A REVIEW. J. P. Mathis, T. Fonong, and J. C. Tsang, Illinois State University, Normal.
9:40 AM	33	HYDROLYTIC EFFECTS OF POLYMYXIN B AND POLYAMINES OF WHOLE CELLS OF SERRATIA MARCESCENS. D. M. Barnett, J. Mathis, and J. C. Tsang, Illinois State University, Normal.
10:00 AM	34	PROSTAGLANDIN ACCUMULATION IN VITRO BY MOUSE UTERUS AND OVIDUCT. S. Saffaripour and M. A. Jones, Illinois State University, Normal.
10:20 AM		BREAK
10:30 AM	35	ANALYSIS OF PROTEINS OF THE DAY-SIX RABBIT OVIDUCT. M. Ostap, M. A. Jones, Illinois State University, Normal, and M. J. K. Harper, The University of Texas Health Science Center, San Antonio, TX.
10:50 AM	36	PROBLEMS OF TOXIC CHEMICAL USE. C. Zeigler, J. Neaves, and A. Mitchell, Blackhawk College, Moline.
11:10 AM	37	A GENERAL TWO STEP SYNTHESIS OF PYRROLIDINES. J. R. McClure, D. A. Lill, and J. P. Haar, Southern Illinois University, Edwardsville.
11:25 AM		BUSINESS MEETING

COMPUTER SCIENCE DIVISION

DIVISION CHAIR:
Charles Neblock
Department of Computer Science
Western Illinois University
Macomb, Illinois 61455

ROOM: Greenup

SESSION I - Friday, April 10

PRESIDING: Charles Neblock

TIME	PAPER #	
2:00 PM	38	NUMERICAL SOLUTION OF INITIAL VALUE PROBLEMS IN FLUID FLOW. S. K. Dey, Eastern Illinois University, Charleston, and C. Dey, Charleston High School, Charleston.
2:20 PM	39	GENERATING NUMERICAL SEMIGROUPS. C. G. Fleming and J. D. Halchin, Eastern Illinois University, Charleston.
2:40 PM	40	PC GRAPHICS ANIMATION AND SCOTTISH COUNTRY DANCE INSTRUCTION. J. A. Schiek and P. Lamont, Western Illinois University, Macomb.
3:00 PM	41	THE POTENTIAL ROLE OF COMPUTER BASED INSTRUCTION IN TECHNICAL EDUCATION AS RELATED TO THE "RETRAIN AMERICA" EFFORT. R. N. Woll, N. Woll and Company, Inc., San Jose.
3:20 PM		BREAK
3:40 PM	42	DESIGN AND DEVELOPMENT OF A STORY GENERATOR. M. J. Meredith and D. Koga, Blackburn College, Carlinville.
4:00 PM	43	A CLASSIFICATION EXPERT SYSTEM. K. Derheimer and P. Lamont, Western Illinois University, Macomb.
4:20 PM	44	NEW DESIGN TECHNIQUE FOR FIRST-ORDER COMPENSATOR. L. Youn, A. Godhwani, and J. Chen, Southern Illinois University, Edwardsville.
4:40 PM		BUSINESS MEETING

EARTH SCIENCE DIVISION

DIVISION CHAIR:
Peter Calengas
Department of Geology
Western Illinois University
Macomb, IL 61455

ROOM: Oakland

SESSION I - Saturday, April 11

PRESIDING: Peter Calengas

TIME	PAPER #	
8:00 AM		BUSINESS MEETING
8:30 AM	45	A MEGAFAUNA FROM THE GROVE CHURCH SHALE (UPPER MISSISSIPPIAN) OF SOUTHERN ILLINOIS. G. H. Fraunfelter, Southern Illinois University, Carbondale.
8:45 AM	46	TWO BRYOZOAN FAUNULES FROM THE LATE PENNSYLVANIAN OF ILLINOIS. J. F. Stratton, Eastern Illinois University, Charleston, and A. S. Horowitz, Indiana University, Bloomington, IN.
9:00 AM	47	VARIABILITY IN TWO CONULARID SPECIES FROM THE LATE PENNSYLVANIAN OF ILLINOIS. K. A. Meyerholtz, Indiana University, Bloomington, IN, and J. F. Stratton, Eastern Illinois University, Charleston.
9:15 AM	48	USE OF 87Sr/86Sr RATIOS IN TRACING GROUNDWATER FLOW PATHS INTO CEDAR BOG, OHIO. S. G. Price and P. Pushkar, Wright State University, Dayton, OH.
9:30 AM	49	EFFECT OF CRUSTAL THICKNESS ON MAGMA COMPOSITION: STUDY OF TWO CHILEAN VOLCANOES. N. J. McMillan, Eastern Illinois University, Charleston.
9:45 AM	50	CHEMICAL EVIDENCE FOR CRUSTAL CONTAMINATION IN THE SOUTHERN VOLCANIC ZONE OF CHILE. J. Earle and N. J. McMillan, Eastern Illinois University, Charleston.
10:00 AM		BREAK
10:15 AM	51	PETROGRAPHIC AND CHEMICAL EVIDENCE FOR MAGMA MIXING AT VOLCAN MOCHOCHOSHUENCO, CHILE. E. Knoebl and N. J. McMillan, Eastern Illinois University, Charleston.

10:30 AM 52 SR ISOTOPES AND MIGRATION OF OIL-FIELD BRINES FROM SILURIAN-DEVONIAN AND MISSISSIPPIAN STRATA IN THE ILLINOIS BASIN. A. M. Stueber, Southern Illinois University, Edwardsville, and P. Pushkar, Wright State University, Dayton, OH.

10:45 AM 53 RECENT FINDINGS FROM THE VOLCANICLASTIC DEPOSITS AT KAKANUI, NEW ZEALAND. P. P. Sipiera, Harper College, Palatine.

11:00 AM 54 EARLY PENNSYLVANIAN PALEOGEOLOGY AND PALEO-TOPOGPHY OF ROCK ISLAND COUNTY, ILLINOIS. R. L. Leary, Illinois State Museum, Springfield.

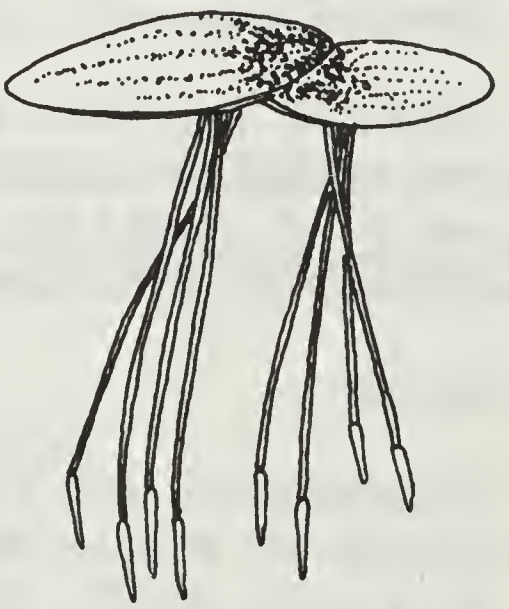
11:15 AM 55 ICE LOADING OF GLACIAL LAKE ILLINOIS SEDIMENTS, PERU, ILLINOIS. R. S. Nelson, Illinois State University, Normal.

11:30 AM 56 AMPHIBOLE-BEARING PHONOLITES IN THE BLACK HILLS, S.D. J. G. Kirchner, Illinois State University, Normal.

11:45 AM 57 ENVIRONMENT OF DEPOSITION OF THE HOUX LIMESTONE. T. K. Searight, Illinois State University, Normal.

12:00 AM 58 DELINEATING AN ABANDONED MINE TUNNEL USING VERTICAL ELECTRICAL SOUNDINGS AT A LANDFILL, VERMILION COUNTY, ILLINOIS. P. C. Reed, Illinois State Geological Survey, Champaign, and C. E. Clark, Clark Engineering Service, Springfield.

12:15 AM 59 THE GEOCHEMISTRY OF THE STATEN ISLAND SERPENTINITE. S. D. York, Hofstra University, Hempstead, NY.



ENVIRONMENTAL SCIENCE DIVISION

DIVISION CHAIR:
Gerald Gaffney
Department of Forestry
Southern Illinois University
Carbondale, Illinois 62901

ROOM: Effingham

SESSION I - Friday, April 10

PRESIDING: Gerald Gaffney

TIME	PAPER #	
9:45 AM		BUSINESS MEETING
10:00 AM	60	THE SEDIMENTARY RECORD OF EUTROPHICATION IN TWO WASHINGTON LAKES. R. B. Brugam, Southern Illinois University, Edwardsville.
10:15 AM	61	PHYTOPLANKTON PRODUCTIVITY IN THE ATCHAFALAYA BASIN. J. Verduin, Southern Illinois University, Carbondale.
10:30 AM	62	ACID RAIN AND GROWTH OF FOREST TREES IN SOUTHERN ILLINOIS. C. C. Myers, Southern Illinois University, Carbondale.
10:45 AM	63	POTENTIAL FOR SILVICULTURAL HERBICIDES IN THE CENTRAL HARDWOOD FOREST REGION. W. Bristow, G. Gaffney, and D. Shenaut, Southern Illinois University, Carbondale.
11:00 AM	64	POSTEMERGENCE WEED CONTROL IN PINE PLANTATIONS. D. Shenaut, G. Gaffney, and W. Bristow, Southern Illinois University, Carbondale.
11:15 AM	65	PSYCHOLOGICAL THEORIES AND RESOURCE MANAGEMENT. C. F. Donow and P. A. Yambert, Southern Illinois University, Carbondale.
11:30 AM	66	ENDANGERED SPECIES AND ENLIGHTENED LIFESTYLES. P. A. Yambert, Southern Illinois University, Carbondale.

MEDICAL SCIENCE DIVISION

DIVISION CHAIR:
Carol Lewandowski
University of Illinois at Chicago
PCRPS - Room 310
P. O. Box 6998
Chicago, Illinois 60680

ROOM: Charleston

SESSION I - Friday, April 10 PRESIDING: Carol Lewandowski

TIME	PAPER #	
9:00 AM	67	EVALUATION OF PLATELETS IN BOVINE BLOOD AS A FUNCTION OF THE REPRODUCTIVE STATE OF THE ANIMAL. S. K. Hardesty, M. A. Jones, and C. L. Moore, Illinois State University, Normal.
9:15 AM	68	ALPHA-1-ANTITRYPSIN CONCENTRATIONS IN LUNG LAVAGE SAMPLES. P. A. Reidy and M. A. Jones, Illinois State University, Normal.
9:30 AM	69	POTENTIATION OF MACROPHAGE FUNGICIDAL ACTIVITY FOR CRYPTOCOCCUS NEOFORMANS BY LYMPHOKINES. A. P. Browning and D. J. Kitz, Southern Illinois University, Edwardsville.
9:45 AM	70	ANTIBIOTIC-MEDIATED ENHANCEMENT OF MURINE IMMUNE RESPONSE BY CLINDAMYCIN AND LINCOMYCIN. H. R. Neuman and D. J. Kitz, Southern Illinois University, Edwardsville.
10:00 AM	71	LECTIN BINDING AFFINITY IN NORMAL SKIN AND BENIGN, PREMALIGNANT, AND MALIGNANT CUTANEOUS LESIONS. A. Armin, R. Gradini, P. D. Toto, H. Nadimi, A. M. Eng, and R. Martinez, Loyola University, Chicago.
10:15 AM		BREAK
10:30 AM	72	ULTRASTRUCTURE OF THE C57 MOUSE ANTEROVENTRAL COCHLEAR NUCLEUS. W. E. Briner, J. F. Willott, and L. Hanzely, Northern Illinois University, DeKalb.
10:45 AM	73	ULTRASTRUCTURE OF THE ANTEROVENTRAL COCHLEAR NUCLEUS OF THE C57 MOUSE-EFFECTS OF AGE AND HEARING LOSS. W. E. Briner, J. F. Willott, and L. Hanzely, Northern Illinois University, DeKalb.

11:00 AM 74 USE OF A MICROMETHOD TO STUDY OPTIC NERVE PROTEIN OF AGING RATS. A. S. Jacks, A. G. Richardson, C. T. Wismer, and M. A. Jones, Illinois State University, Normal.

11:15 AM 75 THE ROLE OF A MANNOSE RECEPTOR IN MACROPHAGE UPTAKE OF CANDIDA ALBICANS. D. J. Kitz and D. K. Wohlfeil, Southern Illinois University, Edwardsville.

11:30 AM 76 EFFECTS OF DIETARY FATS ON SERUM TOTAL CHOLESTEROL OF MICE. E. C. Beyers, J. M. Johnson, and M. A. Jones, Illinois State University, Normal.

ROOM: Charleston

SESSION II - Friday, April 10 PRESIDING: Carol Lewandowski

2:00 PM 77 DEVELOPING DRUG TESTING CAPABILITIES. E. F. Jason and H. L. Dapron, Southern Illinois University, Edwardsville.

2:15 PM 78 A REDUCTION IN THE RATE OF BLOOD PRESSURE ELEVATION IN SPONTANEOUSLY HYPERTENSIVE RATS (SHR) THROUGH AN EXERCISE PROGRAM. R. Crowell, R. Bartow, Blackburn College, Carlinville, and S. Cardoso, UTCHS, Memphis, TN.

2:30 PM 79 EFFECTS OF ACUTE UNDERWATER (ANAEROBIC) SWIMMING INTENSITY ON PLASMA LEVELS OF CORTICOSTERONE, CREATINE PHOSPHOKINASE (CPK) AND LACTIC DEHYDROGENASE (LDH) IN MALE RATS. A. M. Garcy, Chicago State University, Chicago.

2:45 PM 80 MEDICINAL PLANTS OF ILLINOIS - THE WILDFLOWERS. C. B. Lewandowski, M. L. Quinn, and N. R. Farnsworth, University of Illinois at Chicago.

3:00 PM BREAK

3:45 PM BUSINESS MEETING

MICROBIOLOGY DIVISION

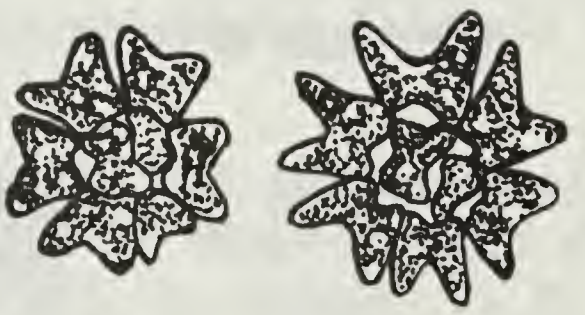
DIVISION CHAIR:
Amrik S. Dhaliwal
Department of Biology
Loyola University
Chicago, Illinois 60626

ROOM: Kansas

SESSION I - Friday, April 10

PRESIDING: Amrik Dhaliwal

TIME	PAPER #	
9:30 AM	81	PREPARATION OF A MODERATE HALOPHILE, HALOBACTERIUM VOLCANII, FOR SEM STUDY. L. Kepple, Southern Illinois University, Carbondale.
9:45 AM	82	ELECTRON MICROSCOPY OF SUDDEN DEATH DISEASE OF SOYBEANS (SDS). J. J. Bozzola, J. Yopp, M. Krishnamani, J. Richardson, and O. Myers, Southern Illinois University, Carbondale.
10:00 AM	83	EFFECTS OF ZINGIBERACEAE RHIZOME EXTRACT ON THE INFECTIVITY OF CYANOPHAGE LPP-1. M. A. Dean, A. S. Dhaliwal, and W. R. Jones, Loyola University, Chicago.
10:15 AM		BREAK
10:30 AM	84	A STRAIN OF XANTHOMONAS MAY CAUSE SUDDEN DEATH DISEASE OF SOYBEANS (SDS). J. J. Bozzola, J. Yopp, M. Krishnamani, J. Richardson, and O. Myers, Southern Illinois University, Carbondale.
10:45 AM	85	ENCEPHALOMYOCARDITIS VIRAL INFECTION IN HUMAN ERYTHROLEUKEMIC CELLS (K562). M. Hart and P. Wanda, Southern Illinois University, Edwardsville.
11:00 AM		BUSINESS MEETING



SCIENCE, MATHEMATICS, AND TECHNOLOGY EDUCATION

DIVISION CHAIR:
Alan Voelker
Department of Curriculum and Instruction
Northern Illinois University
DeKalb, Illinois 60115

ROOM: Kansas

SESSION I - Friday, April 10

PRESIDING: Alan Voelker

TIME	PAPER #	
2:00 PM	86	CURRENT TRENDS IN INTERNATIONAL TRAINING AND EDUCATION IN THE TECHNOLOGIES. R. N. Woll, N. Woll and Company, Inc., San Jose.
2:20 PM	87	EXPECTATIONS OF COMMUNITY COLLEGE INSTRUCTORS ABOUT COLLEGE FRESHMEN CHEMISTRY STUDENTS. T. Mitchell, Black Hawk College, Moline.
2:40 PM	88	A PROCESS APPROACH TO TEACHING FUNDAMENTAL SCIENCE CONCEPTS TO ELEMENTARY EDUCATION MAJORS. V. Carter, B. Shmaefsky, D. Winnett, and F. Zurheide, Southern Illinois University, Edwardsville.
3:00 PM		BUISNESS MEETING

ZOOLOGY DIVISION

DIVISION CHAIR:
Robert J. Wolff
Trinity Christian College
6601 West College
Palos Heights, Illinois 60463 ROOM: Mattoon

SESSION I - Friday, April 10 PRESIDING: George Feldhamer

TIME	PAPER #	
9:30 AM	89	PREDICTION OF RICE RAT DISTRIBUTION IN SOUTHERN ILLINOIS USING A GEOGRAPHIC INFORMATION SYSTEM. W. U. Brigham, J. E. Hofmann, and J. E. Gardner, Illinois Natural History Survey, Champaign.
9:45 AM	90	NESTING REQUIREMENTS OF LOGGERHEAD SHRIKES (LANIUS LUDOVICIANUS) IN SOUTH-CENTRAL ILLINOIS. B. E. Lane and L. B. Hunt, Eastern Illinois University, Charleston.
10:00 AM	91	DENSITY OF CERTAIN BREEDING RAPTOR POPULATIONS IN SOUTHERN ILLINOIS. P. T. Hughes, Governors State University, University Park.
10:15 AM		BREAK
10:45 AM	92	STATUS OF THE PALLID CHUB, HYBOPSIS AMNIS, A RARE ILLINOIS FISH. T. J. Kwak, Illinois Natural History Survey, Champaign.
11:00 AM	93	SEVEN YEAR STUDY OF THE EFFECTS OF PHOTOPERIODS ON THE CIRCANNUAL RHYTHM OF THE GERBILL. J. J. Natalini, Quincy College, Quincy.

ROOM: Mattoon

SESSION II - Friday, April 10 PRESIDING: Armando Amador

2:00 PM		BUSINESS MEETING
2:30 PM	94	AQUATIC MACROINVERTEBRATES AS INDICATORS OF WATER QUALITY IN THE CACHE RIVER DRAINAGE. M. A. Phillippi, Southern Illinois University, Carbondale.
2:45 PM	95	DEVELOPMENTAL REGULATION OF ARGININE KINASE IN DROSOPHILA. J. M. James, Eastern Illinois University, Charleston.

3:00 PM 96 MORPHOLOGICAL ASYMMETRY WITHIN THE COLONS OF HETEROMYID RODENTS: A POSSIBLE CORRELATION WITH HABITAT. G. L. Forman, Rockford College, Rockford.

3:15 PM 97 POSSIBLE USE OF FINE STRUCTURAL DETAILS OF SPERMATOZOAN TAILS AS AN AID IN ESTABLISHING ANURAN PHYLOGENY. W. S. James, Eastern Illinois University, Charleston.

3:30 PM BREAK

3:45 PM 98 CHARACTERIZATION OF AXOLOTL ACID HYDROLASES INVOLVED IN REGENERATION. M. Mandala and W. L. Daniel, University of Illinois, Urbana.

4:00 PM 99 RATES OF SYNTHESIS AND CLEARANCE OF MURINE HEPATIC ARYLSULFATASE B. W. L. Daniel and L. A. Westfield, University of Illinois, Urbana.

4:15 PM 100 TOXIC EFFECTS OF GOSSYPOL ON ULTRASTRUCTURE OF RAT HEART MITOCHONDRIA. L. C. Pan, D. R. Jensen, and M. J. Nadakavukaren, Illinois State University, Normal.

4:30 PM 101 THE PINEAL AND TESTICULAR HORMONE RECEPTORS IN SYRIAN HAMSTERS. A. G. Amador and A. Bartke, Southern Illinois University, Carbondale.

POSTER SESSION

Friday, April 10* ROOM: Grand Ballroom
5:15 - 6:15 p.m.

POSTER #

102 STATUS UPDATE ON KANKAKEE MALLOW IN ILLINOIS. W. D. Glass and J. Schwegman, Illinois Department of Conservation, Springfield.

103 SUMMARIZING ILLINOIS ENDANGERED PLANT SPECIES INFORMATION WITH ILPIN AND RPC. L. R. Iverson, P. Burton, D. Ketzner, and K. Robertson, Illinois Natural History Survey, Champaign.

104 LEAF ARCHITECTURE IN CULCASIA. L. A. Taylor and R. C. Keating, Southern Illinois University, Edwardsville.

105 TESTING PLANTS FOR CYANIDE PRODUCTION. K. E. Aikman and D. L. Bergman, Eastern Illinois University, Charleston.

106 FALLING SPRING--ACTIVE TUFA FORMATION IN SOUTHERN ILLINOIS. D. G. Rands, J. S. Davis, B. J. Keller, and J. Lucero, Southern Illinois University, Edwardsville.

107 DISSECTION OF ALLUVIAL DEPOSITS AFTER FAILURE OF THE LAKE CHARLESTON SPILLWAY. V. P. Gutowski and E. Mears, Eastern Illinois University, Charleston.

108 IMMUNOHISTOCHEMICAL STUDY OF BOWEN'S DISEASE, BASAL CELL CARCINOMA, AND SQUAMOUS CELL CARCINOMA IN THE SKIN. A. Armin, R. Gradini, P. D. Toto, A. M. Eng, H. Nadimi, and R. Martinez, Loyola University of Chicago, Maywood.

109 IMMUNOHISTOCHEMICAL STUDY OF NORMAL SKIN. A. Armin, R. Gradini. P. D. Toto, A. M. Eng, H. Nadimi, and R. Martinez, Loyola University of Chicago, Maywood.

110 LIPID BIOSYNTHESIS IN ARRESTED PHASE DIPLOID CHICK FIBROBLASTS. J. D. Lane and P. J. Nielsen, Western Illinois University, Macomb.

111 ISOLATION AND CHARACTERIZATION OF PLASMIDS FROM BACILLUS SUBTILIS (NATTO). K. A. Rennick, R. J. Bothast, and N. J. Alexander, Northern Regional Research Center, Peoria.

112 A SURVEY OF UNDERGRADUATE STUDENTS AT EASTERN ILLINOIS UNIVERSITY CONCERNING EVOLUTION AND CREATIONISM. T. M. Weidner, Eastern Illinois University, Charleston.

113 OSTEOLOGICAL DIFFERENCES DISTINGUISHING REDEAR SUNFISH, LEPOMIS MICROLOPHUS (GUNTHER) FROM OTHER LEPOMIS SPECIES. M. L. Colburn, Illinois State Museum, Springfield.

114 MODERN ZOOS AND SPECIES CONSERVATION. D. M. Jedlicka, University of Illinois at Chicago.

115 ASSESSING BALD EAGLE USE OF ARTIFICIAL PERCHES. P. L. Malmborg and G. C. Vanderah, Illinois Natural History Survey, Champaign.

* NOTE: Some of the posters will be available for viewing on Saturday morning (April 11) in the reception area on the third floor of the University Union.

SYMPOSIUM -- ENDANGERED SPECIES

SYMPOSIUM ORGANIZER:
Susan E. Lauzon
Endangered Species Protection Board
Lincoln Tower Plaza
Springfield, Illinois 62701

ROOM: Tuscola

SESSION I - Friday, April 10

PRESIDING: Susan Lauzon

TIME	PAPER #	
2:00 PM	116	A PRACTICAL APPROACH TO ENDANGERED PLANT CONSERVATION. J. E. Schwegman, Illinois Department of Conservation, Springfield.
2:15 PM	117	ILLINOIS ENDANGERED AND THREATENED PLANT SPECIES LIST UPDATE PROJECT. M. L. Bowles, The Morton Arboretum, Lisle.
2:30 PM	118	POPULATION STATUS, ECOLOGY, AND MANAGEMENT NEEDS OF THE HEART-LEAVED PLANTAIN (PLANTAGO CORDATA MICHX.) AT THE MACKINAW RIVER RECREATION AREA, TAZEWELL CO., IL. M. L. Bowles and S. I. Apfelbaum, The Morton Arboretum, Lisle.
2:45 PM	119	BLACK-CROWNED NIGHT-HERON USE OF AN ARTIFICIAL NESTING STRUCTURE. S. M. Byers, S. Storlid, and G. V. Burger, Max McGraw Wildlife Foundation, Dundee.
3:00 PM	120	BIOLOGY OF THE BLUEHEAD SHINER, NOTROPIS HUBBSI, AN ILLINOIS ENDANGERED SPECIES. B. M. Burr, R. C. Heidinger, and D. E. Fletcher, Southern Illinois University, Carbondale.
3:15 PM		BREAK
3:30 PM	121	DISCOVERY OF INDIANA BAT (MYOTIS SODALIS) MATERNITY ROOST TREES IN WESTERN ILLINOIS. J. E. Gardner, J. E. Hofmann, Illinois Natural History Survey, Champaign, and J. D. Garner, Illinois Department of Conservation, Springfield.
3:45 PM	122	PAST STUDIES OF THE RIVER OTTER (LUTRA CANADENSIS) IN ILLINOIS. E. A. Anderson, Illinois Department of Conservation, Alton.
4:00 PM	123	CHICAGO PEREGRINE RELEASE: THE FIRST YEAR. M. Spreyer, The Chicago Academy of Science.

SYMPOSIUM -- INVERTEBRATES OF ILLINOIS AND THE MIDWEST

SYMPOSIUM ORGANIZER:
Robert J. Wolff
Trinity Christian College
6601 West College
Palos Heights, Illinois 60463

ROOM: Arcola

SESSION I - Friday, April 10

PRESIDING: Robert Wolff

TIME	PAPER #	
9:00 AM		INTRODUCTION: THE INVERTEBRATES OF ILLINOIS AND THE MIDWEST. R. J. Wolff, Trinity Christian College, Palos Heights.
9:10 AM	124	HELMINTH PARASITES OF FISHES OF ILLINOIS AND ADJACENT STATES. D. G. Myer, Southern Illinois University, Edwardsville.
9:30 AM	125	HELMINTH PARASITES OF AMPHIBIANS FROM ILLINOIS AND ADJACENT MIDWESTERN STATES: A REVIEW. W. G. Dyer and P. R. Varble, Southern Illiniois University, Carbondale.
9:45 AM	126	HELMINTH PARASITES OF ILLINOIS MAMMALS. H. Pigage and J. Pigage, Elmhurst College, Elmhurst.
10:00 AM	127	PENTASTOMIDA OF THE ILLINOIS AREA: A REVIEW. G. S. Garoian, Southern Illinois University, Carbondale.
10:10 AM		BREAK
10:30 AM	128	THE BIVALVIA (MOLLUSCA) OF ILLINOIS. K. Cummings, Illinois Natural History Survey, Champaign.
10:45 AM	129	TERRESTRIAL GASTROPODS IN ILLINOIS. D. S. Franzen, Illinois Wesleyan University, Bloomington.
11:05 AM	130	AS THE WORM TURNS: AQUATIC OLIGOCHAETA IN ILLINOIS. M. J. Wetzel, Illinois Natural History Survey, Champaign.
11:20 AM	131	IN PURSUIT OF OPPORTUNITY: AQUATIC HIRUDINEA IN ILLINOIS. M. J. Wetzel, Illinois Natural History Survey, Champaign.

11:35 AM 132 THE ANGLE ON THE ANGLE-WORMS OR EARTHWORMS (OLIGOCHAETA) OF THE MIDWEST. R. J. Wolff, Trinity Christian College, Palos Heights.

ROOM: Arcola

SESSION II - Friday, April 10

PRESIDING: Robert Wolff

TIME	PAPER #	
2:30 PM	133	THE SPONGES (PORIFERA) OF ILLINOIS. J. A. Beatty, Southern Illinois University, Carbondale.
2:45 PM	134	THE GASTROTRICHA OF ILLINOIS. C. E. Robbins, Loyola University, Chicago.
3:00 PM	135	THE ISOPODA OF ILLINOIS. J. A. Beatty, Southern Illinois University, Carbondale.
3:15 PM	136	CENTIPEDES OF THE NORTH-CENTRAL REGION OF THE UNITED STATES. G. Summers, University of Missouri, Columbia, MO.
3:30 PM		BREAK
3:45 PM	137	THE ACARI - A QUICK FIX. R. C. Funk, Eastern Illinois University, Charleston.
4:00 PM	138	BIOLOGY, STUDY AND ENJOYMENT OF GREAT LAKES HARVESTMEN (ARACHNIDA: OPILIONES). A. L. Edgar, Alma College, Alm, MI.
4:15 PM	139	THE SPIDERS (ARACHNIDA: ARANEAE) OF ILLINOIS. J. A. Beatty and D. Mott, Southern Illinois University, Carbondale.
4:30 PM	140	SPIDERS OF THE FAMILIES SALTICIDAE AND LYCOSIDAE (ARANEAE) FROM ILLINOIS AND THE MIDWEST. R. J. Wolf and B. L. Bootsma, Trinity Christian College, Palos Heights.

ROOM: Arcola

SESSION III - Saturday, April 11 PRESIDING: Robert Wolff

TIME	PAPER #	
9:00 AM	141	A PRELIMINARY CHECKLIST OF ILLINOIS ODONATA WITH A KEY TO GENERA. T. E. Vogt, Natural Land Institute, Rockford, and E. D. Cashatt, Illinois State Museum, Springfield.
9:15 AM	142	THE GRASSHOPPERS, KATYDIDS, AND WALKING STICKS (ORTHOPTERA: ACRIDIDAE, TETTIGONIIDAE, PHASMATIDAE) OF THE PRAIRIES AND SAVANNAS OF ILLINOIS. R. Panzer, Northeastern Illinois University, Chicago.
9:30 AM	143	COLLECTION, IDENTIFICATION AND STUDY OF THE ILLINOIS PSOCOPTERA. G. E. Eertmoed, Chicago State University, Chicago, and E. L. Mockford, Illinois State University, Normal.
9:45 AM	144	THE HEMIPTERA OF ILLINOIS. J. E. McPherson, Southern Illinois University, Carbondale.
9:55 AM		BREAK
10:15 AM	145	THE WEEVILS (COLEOPTERA) OF ILLINOIS. R. Hamilton, Loyola University, Chicago.
10:30 AM	146	THE FAMILY EROTYLIDAE (COLEOPTERA) IN ILLINOIS. M. A. Goodrich, Eastern Illinois University, Charleston, and P. E. Skelley, University of Florida, Gainesville, FL.
10:45 AM	147	THE BUTTERFLIES (LEPIDOPTERA: HESPERIOIDEA & PAPILIONOIDEA) OF THE PRAIRIES AND SAVANNAS OF ILLINOIS. R. Panzer, Northeastern Illinois University, Chicago.
11:00 AM	148	REVIEW OF THE MOTHS OF ILLINOIS WITH EMPHASIS ON THE BIOLOGY OF THE NOCTUIDAE AND NOTODONTIDAE. G. L. Godfrey, Illinois Natural History Survey, Champaign.
11:15 AM	149	AN INTRODUCTION TO THE COMMON FAMILIES OF ILLINOIS DIPTERA. D. Webb, Illinois Natural History Survey, Champaign.
11:30 AM	150	THE ANTS (HYMENOPTERA: FORMICIDAE) OF ILLINOIS. U. Chapp, Cole-Parmer, Chicago.

-1-

EFFECT OF ZERANOL IMPLANTATION ON WEANING WEIGHT FOR SUCKLING BEEF CALVES. T.L. North and M.F. Zumer, Western Illinois University, Macomb, IL 61455. Twenty-eight calves were divided into two groups at birth on an alternate sex basis so that each experimental unit had animals of approximately the same age and sex breakdown. Treatment animals were ear implanted with zeranol at five, 65, 125, and 185 days of age. Male calves in control and treatment groups were knife castrated at 5 days of age. All animals were weighed at 30-day intervals beginning at five days of age and ending at 215 days of age. At 215 days of age, implanted calves had a significantly greater ADG than non-implanted calves, 2.30 vs 2.06 lb, representing a 43 lb weight advantage. This difference was entirely due to the better performance of implanted castrate males, 2.41 vs 1.97 lb/day for a 93 lb advantage, whereas both implanted and non-implanted females had identical ADG of 2.16 kg.

-2-

EFFICIENCY COMPARISON BETWEEN BULLS, SHORT SCROTUM BULLS AND STEERS. P. M. Walker, M. Messman and B. E. Hallbauer*. Illinois State University, Normal, IL 61761. Forty-five cattle in two trials were assigned to one of three treatment groups at birth to measure postweaning finishing efficiency. Every third male calf at birth was assigned to 1) remain an intact male or bull (B), 2) be sterilized by induced cryptorchidism or short scrotum bull (SS), or 3) be sterilized by elastrator castration or steer (S). Bulls significantly outperformed SS which outperformed S in both ADG and F:G. Bulls had significantly larger testicle weights than did SS. Quality grades and Warner-Bratzler shear values were not different ($P>.05$) between the three treatments. No difference ($P<.05$) was observed in acceptance of ribeye steaks between treatments by a trained taste panel. This study supports other findings that bulls gain faster and more efficiently than steers and suggests there is no advantage for SS over B.

-3-

EFFICIENCY COMPARISON OF TWO BIOLOGICAL TYPES OF COWS, MEDIUM FRAME HEREFORD-ANGUS CROSS AND LARGE FRAME CHIANINA-ANGUS CROSS, PHASE I AND II PROGRESS REPORT. P. M. Walker, M. Messman and *A. Prill. Illinois State University, Normal, IL 61761. Twenty-five crossbred cows and their calves were individually fed during their first two years of production to measure efficiency of production. Large frame cows (LF) consumed more ($P<.10$) Mcal of metabolizable energy (ME) per year, produced more kg of milk and weaned heavier calves than did medium frame cows. Efficiency ratios (Mcal of ME) required per kg of calf weaning weight were similar between LF and MF. Thus far, this study suggests that LF and MF have similar efficiencies of production.

-4-

AEROBIC WASTE DISPOSAL IN A MODIFIED SOIL FILTER. P. M. Walker and *M. Messman, Illinois State University, Normal, IL 61761. Three trials were designed to test a patented process for the aerobic degradation of livestock waste in which air is drawn through a gravel filter by vacuum pump. The filter systems consisted of two 1.52 m x 2.13 m steel pans .76 m deep filled with pea gravel not exceeding 1.27 cm in diameter. Aeration tubes attached to a vacuum pump permeated the floor in each filter in two patterns. In trial 1, yearling lambs were housed in pens built over the filter systems. In trial 2, growing pigs averaging 22.7 kg were housed over the filter systems. Trial 3 consisted of daily dosing of each gravel filter with deep ditch liquid manure and cow manure collected from open concrete lots. A stable effective aerobic degradation was not established in any of the trials. Further study of this waste disposal system is needed and is anticipated before recommendations can be made to producers.

-5-

ESTROUS SYNCHRONIZATION IN GILTS WITH THE AID OF PROSTAGLANDINS. D. Walker and Dr. S. Webel, Illinois State University, Normal, IL 61761. One possible means of establishing a practical system for synchronizing estrous in gilts involves the proper scheduling of PMSG, HCG, and prostaglandin F2 injections. 10001.u. of PMSG followed by 400 1.u. HCG in 72 to 96 hours will induce estrous and control time of ovulation in prepubertal gilts. Prostaglandin F2 has been shown effective in causing abortions with a uniform return to estrous in some strains of bred gilts. Preliminary trials indicate that prostaglandin F2 injection on day 14 following HCG treatment is the proper schedule for treatments. All gilts on this schedule returned to estrous within 72 hours. For gilts bred during the PMSG, HCG induced heat and subsequently treated with prostaglandin F2, 12, 14 or 16 dyas later a substantial proportion did not show any signs of returning to estrous. This indicates that further evaluation due to treatment schedule and breed characteristics are required in more mature gilts.

-6-

SUPEROVULATORY RESPONSE OF DONOR COWS. C. L. Moore, A. Abjean-Uguen, and S. Mevel, Illinois State University, Normal, IL 61761. A questionnaire was sent to 138 Embryo Transfer Companies (ETC) to study various factors affecting the superovulatory response. Thirty-one questionnaires were completed and returned. According to the survey, 62% of the ETC take into account the different ovulatory responses of breeds. Seventy-one percent of ETC consider age of the donor when determining the amount of FSH. In many cases (28 ETC), the heifers received approximately 25% less FSH than mature cows. Follicle stimulating hormone (FSH) was used by all companies to induce superovulation and was supplied by Schering (Burns Biotex). Pregnant mare serum (PMS) was only occasionally used. Porcine was the principal species origin of FSH (77.4%). Bovine FSH was used by 12.9% and mixed species accounted for 9.7%. The FSH potency varied from 35-65 mg per vial although a majority of the companies (15) reported a potency of 50 mg per vial. Embryo Transfer Companies using a descending injecting schedule resulted in better performances to superovulation. Numbers of corpora lutea, embryos collected, embryos implanted and 60-90 day pregnancies increased with a descending schedule.

-7-

A SURVEY OF EMBRYO TRANSFER USE BY ILLINOIS ANGUS BREEDERS AND SELECTED AMERICAN ANGUS BREEDERS. P. M. Walker, J. R. Winter and K. Reeser.* Illinois State University, Normal, IL 61761. Questionnaires were mailed to all Illinois Angus breeders and 50 selected Angus breeders nationwide to estimate the use of embryo transfer (ET) among purebred cattle breeders. Of the 811 Illinois breeders surveyed, 44% responded. Of the 50 nationwide selected breeders, 66% responded to the survey. A significantly greater number of Illinois breeders did not utilize ET compared to the number which did use ET. A significantly larger percentage of the nationwide selected Angus breeders employed the use of ET. The selected breeders were considered to be elite breeders, whereas every Angus breeder in Illinois, regardless of classification, was sent a questionnaire. This survey suggests that while ET use is widespread, relatively few breeders are employing ET technology in their herds.

-8-

COMPARING METHODS OF FREEZING AND THAWING MOUSE EMBRYOS. C. L. Moore and K. Kreier, Illinois State University, Normal, IL 61761. This trial was set up to study the effect of 2 different cryopreservation procedures on the physical abnormalities of mouse embryos. Mice were superovulated and then flushed to collect the embryos from the oviducts. The embryos were washed and frozen and thawed according to one of the cryopreservation procedures. Following the thaw the embryos were evaluated for any physical abnormality. For procedure #1 using a slow freezing and 35^{o} C thaw, 33 embryos were

recovered, 29 were normal, 3 were abnormal, and 1 was not recovered. When procedure #1 using a slow freezing and 50^{0} thaw was used 28 embryos were recovered, 19 were normal, 6 were abnormal, and 3 were not recovered. For procedure #2 using a quick freezing and 35^{0} C thaw, 30 embryos were recovered, 18 were normal, 7 were abnormal, and 5 were not recovered. When procedure #2 using a quick freezing and 50^{0} C thaw, 27 embryos were recovered, 17 were normal, 7 were abnormal, and 3 were not recovered. A total of 118 embryos were collected from 35 mice, which resulted in 3.37 embryos per mouse.

-9-

PROBLEMS IN THE OIL PATCH: THE EFFECTS OF THE DECLINE IN OIL PRICES IN ILLINOIS BASIN PRODUCTION. K. Harris, Southern Illinois University, Carbondale, IL 62901. Industry and firm-level data indicate that the short-run impact of the recent precipitous oil price decline has been severe for Illinois Basin oil producers. Cash flow and profitability have been dramatically cut, particularly for the smaller producer. At $13 per barrel, a large portion of the state's wells are uneconomical, resulting in abandoned and shut-in production. The lower oil prices have worked their way through the Basin's economy, adversely effecting employment, personal income, real estate values, local taxing bodies, and general business profitability.

-10-

CHANGES IN THE USE OF MARGINAL AGRICULTURAL LAND IN SOUTHERN ILLINOIS: 1980 TO 1986. W.M. Herr, S.E. Kraft, and S. Sundaram, Southern Illinois University, Carbondale, IL 62901. Since 1980, the agricultural economy of Illinois has undergone many changes. In particular, commodity prices have fallen while costs of production have either increased or remained stable. Given these changes, economic theory indicates that marginal land should shift in use from uses that no longer produce positive net incomes to uses that do yield positive net returns. Using data from farm financial records and from a farmer survey, the authors study the extent to which farmers and landowners have shifted land among alternative uses. While the relative profitability of alternative land uses has changed, the data reveal that farmers have not made extensive changes in their use of marginal agricultural land.

-11-

AN APPLICATION OF THE FARMING SYSTEMS METHODOLOGY IN SOUTHERN ILLINOIS. S.E. Kraft, T. Purcell, P.L. Roth, B.H. Taylor, and A. Thielen, Southern Illinois University, Carbondale, IL 62901. The farming systems methodology has been developed and used extensively in rural areas of developing countries. The authors have taken the methodology and adjusted it for use in southern Illinois as well as for use with timber products and fruit production. Using a combination of survey research and sondeo methods, the authors are describing the diversity of production systems that make up agriculture in the southern third of Illinois. In the paper, the authors present their initial findings with respect to southern Illinois and the usefulness of the methodology.

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THE CONSERVATION RESERVE PROGRAM IN ILLINOIS: BIDDING ACTIVITY AMONG ILLINOIS COUNTIES. M.P. Curry, Southern Illinois University, J.D. Esseks, Northern Illinois University, DeKalb, Il. 60115, and S.E. Kraft, Southern Illinois University, Carbondale, Il. 62901. Title XII of the 1985 Food Security Act establishes the Conservation Reserve Program. The policy is designed to take cropland that is eroding at high rates out of crop production as a means to reduce offsite damages from soil erosion. During 1986, there were three sign-up periods during which farm operators and/or owners could offer land to the program through submitting sealed bids to their local ASCS office. An analysis of bidding activity by farmers in Illinois counties indicates a high level of variability. Using regression analysis, the authors try to explain the variation among counties. The authors use a dependent variable based on the percentage of eligible land for the Conservation Reserve that is successfully bid into the program. As independent variables, the authors use characteristics of the farms and agencies located in the various counties studied.

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THE 1985 FARM LEGISLATION, ADJUSTMENTS IN LOAN RATES: IMPACT UPON NET FARM INCOME. Anthony Kerber and Jeffrey Beaulieu, Southern Illinois University, Carbondale, IL 62901-4401. The direction of the 1985 Farm Bill has surfaced. The legislation intends to increase the competitiveness of U.S. exports by decreasing loan rates while maintaining the farm income safety net guaranteed by current target price levels. In this paper the impact of this initiative upon net farm income, given alternative corn and soybean acreage decisions, is presented. Results suggest that from a net income perspective, producers fared better before the legislative change. An analysis, given the legislative changes, of alternative cropping patterns indicates that price and yield expectations determine the best pattern.

-14-

CYANOGENESIS IN ILLINOIS MEMBERS OF THE ROSACEAE AND RANUNCULACEAE. Kevin E. Aikman and John E. Ebinger, Eastern Illinois University, Charleston, IL 61920. Presently 139 members of the Rosaceae and 38 species of the Ranunculaceae are known to be cyanogenic with about 65 of these taxa occurring in northeastern United States. Recent studies indicate that many of these taxa are polymorphic for this trait. Tests of numerous Illinois populations of various species in the Rosaceae and Ranunculaceae suggests that some taxa are only rarely cyanogenic. It is not uncommon for less than 10% of the individuals of populations of Rosa multiflora Thunb., Crataegus mollis (T. & G.) Scheele, Fragaria virginiana Duch., and Ranunculus abortivus L. to be cyanogenic, while in other taxa cyanogenesis is extremely common, occurring in nearly all individuals. Also, this ability to produce cyanide may be restricted to only certain organs of the plant, or to a particular time of the year.

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CYANOGENESIS IN THE UMBILICATE LICHEN DERMATOCARPON MINIATUM (L.) MANN. Daniel L. Bergman and John E. Ebinger, Eastern Illinois University, Charleston, IL 61920. Dermatocarpon miniatum (L.) Mann., an umbilicate lichen that is relatively common throughout most of North America, commonly produces cyanogenic glycosides. In the populations of this species examined in central Illinois, most of the individuals in these populations tested positive for cyanide. Also, of the 23 herbarium specimens tested, 19 were positive. Herbarium specimens of two collections of D. fluviatile (G. Web.) Th. Fr. also gave a positive test for cyanide. As far as can be determined this is the first report of cyanogenesis in lichens.

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THE IMPORTANCE OF GUILDS IN THE ESTABLISHMENT OF PLANT COMMUNITY STRUCTURE IN FIRST YEAR SUCCESSIONAL PLOTS. M.E. Fishbein, T.P. Simon, D.M. Jedlicka, and N.B. Hunter, University of Illinois-Chicago, Chicago, IL 60680. Six 36m^2 plots at the University of Illinois-Chicago were cleared of sod and rototilled in the fall of 1985. In June and October of 1986, 1m^2 quadrats within each plot were sampled for abundance and percent cover of each species. These data indicate a phenological shift in community structure, in terms of diversity and dominance, in the first year. When species are assigned to guild according to phenology, life-history, and, to a lesser extent, habit, the processes affecting this shift become apparent. Species which disperse and establish earlier in the year, or exhibit rapid vegetative extension, can inhibit other species through resource exploitation. Later in the season, these species are succeeded by ones with different strategies, such as later phenology and perennial life-history.

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VEGETATIVE REGENERATION OF TWO MOSSES IN A GRAMINOID COMMUNITY SUBSEQUENT TO BURNING. J.R. Rastorfer, Chicago State University, Chicago, IL 60628. Gametophytic shoots of Polytrichum commune and Aulacomnium palustre were observed after a fall burn at Goose Lake Prairie State Park. Fire damage to the leafy shoots of both species was evident; however, the modes of vegetative regeneration of the two species were different. New shoots of P. commune originated from subterranean rhizome-like structures. In contrast, new shoots of A. palustre originated from the axils of leaves in the basal portions of apparently heat damaged shoots.

-18-

PATTERNS OF SUCCESSION IN URBAN WEED LOTS. N.B. Hunter, T.P. Simon, D.M. Jedlicka, and M.E. Fishbein. University of Illinois-Chicago, Chicago, IL 60680. Urban lots at the University of Illinois-Chicago were studied to assess patterns in secondary succession. M^2 data on frequency and cover of plant species were collected from lots of 1 year and 15 years of age, representing early and middle stages of succession. Alpha diversity (within m^2 quadrats) was highest in the early stage of succession, while beta diversity (between quadrats) was greatest in mid-succession. The dominant species of each stage exhibited different strategies (*sensu* Grimes). Early successional dominants were largely ruderals. Mid-successional dominants tended to be competitors, including clonal and non-clonal herbs and clonal grasses. The data suggest that tolerance and inhibition are important mechanisms of succession.

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PATTERNS OF SPECIES REPLACEMENT AND DOMINANCE IN CHICAGO URBAN WEED SUCCESSION. T. P. Simon, D. M. Jedlicka, N. B. Hunter and M. E. Fishbein, University of Illinois-Chicago, Chicago, IL 60680. Urban weed communities in northeastern Illinois were studied after various time periods of disturbance in the metropolitan area of Chicago. Properties of the urban weed community were investigated during October 1986 by observing weed plots varying in age from 1yr to 10-15yrs. A total of 17-20 species was found in each 1yr garden plot, 17 species within the center of the intermediate lots, and 36 species within the center of the oldest lot. Species composition was largely determined by the presence of the aspect and functional dominant Convolvulus arvensis. An east to west cline of increasing species diversity and height correlated with the amount of open ground available. Species common between the garden plots and the intermediate plots, the intermediate and oldest plots, and the species specific to theoldest plot are examples of the normal progression of early succession in anurban weed community.

-20-

EDGE EFFECT: URBAN WEEDS VERSUS LAWN. D.M. Jedlicka, T.P. Simon, N.B. Hunter, and M.E. Fishbein. University of Illinois at Chicago, Chicago, IL 60680. Six first year weed plots surrounded by lawn were studied at the University of Illinois at Chicago greenhouse. Edges or gaps of disturbance may allow for new species to enter the community by way of dispersal, seed banks, or rhizomal growth. A gradual replacement of Poa pratensis by Convolvulus arvensis was observed in plot #2, while plot #8 showed similar replacement of P. pratensis by Taraxacum officinale, Trifolium repens, and Lepidium densiflorum. This overlap or continum of species from one community (lawn) to another (plot edge) is an example of Gleason's individualistic community theory.

-21-

AN UNDERSTORY SURVEY OF BABER WOODS, EDGAR COUNTY, ILLINOIS. Amy J. Burns and John E. Ebinger, Eastern Illinois University, Charleston, IL 61920. Vegetation sampling was done by establishing four east/west transects 100 m long randomly located throughout the woods. Along each transect 100 1/10 m circular plots were randomly located at one meter intervals. During the spring the number of individuals of all species was 151.1 plants per sq. m. with Claytonia virginica L. and Dentaria laciniata Muhl. accounting for 75% of that total. The number of individuals dropped dramatically during the summer to 14.66 plants per sq. m., and again in the fall to 8.78 plants per sq. m. Acer saccharum Marsh. and Ulmus rubra Muhl. seedlings were present in far greater numbers than any other woody species.

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WOODY UNDERSTORY OF BABER WOODS, EDGAR COUNTY, ILLINOIS. Jacque M. Spencer and John E. Ebinger, Eastern Illinois University, Charleston, IL 61920. The woody understory of Baber Woods was sampled using 10 randomly located transects 100 m long and 1 m wide. In these transects the height, diameter, and age of all woody individuals over 50 cm tall and less than 10 cm dbh were recorded. Acer saccharum Marsh. & Ulmus rubra Muhl. are the dominate understory species, accounting for about 80% of the individuals recorded. Other fairly common taxa include Asimina triloba (L.) Dunal., and Fraxinus americana L. Age/height and age/diameter ratios were also determined for all species under open and closed canopy conditions. In more open area the individuals are of a smaller diameter, younger, and taller than individuals growing under a closed canopy. The survey data was used to develop and understory model of the sample site.

-23-

A NEW STOMATAL TYPE AMONG VASCULAR PLANTS. Benton M. Stidd, Western Illinois University, Macomb, IL 61455. New information on the stomata of a seed fern frond member (Alethopteris sullivanti) confirms that four cells in a paracytic configuration surround the stomatal aperture. Contrary to previous descriptions, however, the smaller cells that have the appearance of guard cells do not form the aperture as in all other stomata. Rather, the stomatal aperture is formed by the larger cells that have the appearance of subsidiary cells. The smaller cells that look like guard cells are contained entirely within the larger cells. Such an arrangement is unknown among vascular plants.

-24-

LATITUDINAL VARIATION IN EASTERN COTTONWOOD. P.A. O'Connor and J.J. Jokela, University of Illinois, Urbana, IL 61801. Seed was collected at six locations along the course of the Mississippi River, vis., Minnesota, Northern Illinois, Missouri, Southern Illinois, Mississippi, Louisiana. One hundred random seedlings issuing from each location were cloned. Replicated plantings of identical clones were made at Stoneville, Mississippi in 1967 and at Urbana and Dixon Springs, Illinois in 1970. Growth rates were inversely related to the latitude of origin. Inherent superior growth rate of the southern sources was offset in the Urbana test by their susceptibility to winter injury. Most trees of origins other than Minnesota and Northern Illinois incurred severe damage from "Southwest Injury" at Urbana. Trees of Mississippi and Louisiana origin exhibited uniform resistance to Melampsora leaf rust in both Illinois plantations.

-25-

GEOGRAPHIC VARIATION IN QUERCUS RUBRA L. B.G. McMahon and J.J. Jokela, University of Illinois, Urbana, IL 61801. A range-wide provenance test of northern red oak was established in Piatt County, Illinois in 1962. Sources from the central portion of the range (37°-43°N latitude) from the Mississippi River to western Ohio were the largest at age 24. The northernmost sources within this zone increased their relative rankings during the past ten years. Sources from near the limits of the species range were the smallest. Sources from the northwestern part of the botanical range are the first to leaf-out and develop the earliest and most pronounced autumn coloration. Southernmost sources remain green until killed by frost.

-26-

INVESTIGATION OF THE REPRODUCTIVE BIOLOGY OF HYMENOXYS ACAULIS VAR. GLABRA: IMPLICATIONS FOR CONSERVATION AND MANAGEMENT. Marcella M, DeMauro, University of Illinois at Chicago, Chicago, IL 60680. Hymenoxys acaulis var. glabra is a herbaceous, perennial compositae which is endangered in Illinois and Ohio. The last Illinois population was extirpated in 1981, however, several plants were saved prior to site destruction. Because subsequent attempts to establish a breeding population for a recovery program failed, a study of the reproductive biology was initiated in 1985. A series of self and cross pollinations using plants from Illinois and Ohio was conducted at the Univ. of IL at Chicago greenhouse. It was found that H. acaulis var. glabra exhibits self-incompatibility and the data indicates that the Illinois population consists of only a few genotypes which are not cross compatible. In small or declining populations, a reduction in the number of cross compatible genotypes may increase the chances of incompatible matings. For the Illinois population, this appears to be the case. Thus, consideration of critical genetic and demographic factors of a breeding system are important for future recovery and management programs.

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DIFFERENCES IN THE DROP TIMES OF PROPAGULES OF LIATRIS ASPERA AMONG PRAIRIE, SAVANNA, AND DUNE SUBPOPULATIONS. Louis Mulé, University of Illinois at Chicago, Chicago, IL 60607. Physical factors may influence the dispersal potential of Liatris aspera (Compositae) propagules including achene mass and the presence of a pappus. The mass of the pappus and achene of this perennial varies among prairie, savanna, and sand dune subpopulations. The dispersal potential of these propagules was tested by dropping them in tubes, short (1.5m) and long (3.0m), and timing their descent in seconds. For long and short distances, the prairie samples took significantly longer to descend than the dune samples. Savanna timings were also significantly different than the other habitats. This relationship did not hold up consistently over the short distance when achenes without pappuses were dropped. This data suggests that, for longer distances, achenes and pappus mass together may be important for achieving dispersal distances needed for colonization.

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HUDSONIA TOMENTOSA: AN ENDANGERED PLANT'S RESPONSE TO FIRE. R. W. Nyboer, Illinois Department of Conservation, 2612 Locust Street, Sterling, Illinois 61801. The state endangered beach heather, (Hudsonia tomentosa Nutt.) is a plant that colonizes open sand and blowouts in dry sand prairies. Monitoring plots were established in the largest known populations of this species at Ayers Sand Prairie Nature Preserve in 1980. The plots were established to determine the growth and reproductive potentials as well as its response to prairie sucession and fire. Although prescribed burns are an accepted and needed management tool for maintaining prairies, the Ayers Preserve has had a long history of unprescribed wildfires caused accidentally by the urban and rural neighbors of the preserve. These wildfires have decimated large colonies of the beach heather. Regrowth of this species from the fires has been exceptionally slow. The best response appears to be plants unburned within a burned colony. Very few plants are reestablishing by either resprouting or from seeds.

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A FLORISTIC SURVEY OF THE VASCULAR PLANTS OF SPRING LAKE PARK AND ADJACENT AREA, MCDONOUGH COUNTY, ILLINOIS. Clare K. Wirmum, Western Illinois University, Macomb, 61455.
A floristic survey of Spring Lake and adjacent area McDonough County, Illinois, was conducted between March 17, 1985, to October 17, 1986. From the field data, 20 major and minor ecological communities are described using the original physiography of the area, the relative amount of soil moisture, and the degree of disturbance as the criteria for classification. An annotated catalog of 4 divisions, 94 families, 284 genera, 467 species, four sub species, 31 varieties, and one hybrid of vascular plants was prepared with the Magnoliophyta being the largest taxon.

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THE EFFECT OF INFECTION BY ERYSIPHE GRAMINIS f. sp. HORDEI CULTURE CR3 ON HOST-NUCLEAR PROTEINS AND NUCLEIC ACIDS IN ISOGENIC LINES OF RESISTANT AND SUSCEPTIBLE BARLEY COLEOPTILE. P.K. Bhattacharya, Indiana University Northwest, Gary, IN 46408. Changes in host-nuclear DNA, RNA, total nucleic acid (TNA), histone, non-histone, total protein (TP) contents, and the nuclear volume in parasitized host cells compared to healthy coleoptile were cytofluorometrically determined. In both varieties, even at 18 hours after inoculation while nuclear histone losses were accompanied by concomittant increases in RNA, non-histone proteins, including the nuclear volume, the observed changes occurred to a much greater extent in the resistant barley compared to those in coleoptile cells of susceptible variety. DNA content decreased only at 114 hours after inoculation. The significance of these results are discussed in light of the data reported earlier in wheat rust system as they relate to the underlying basis of host resistance and susceptibility to biotrophic fungi.

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AN ENZYME METHOD FOR THE SPECTROPHOTOMETRIC DETERMINATION OF MICRO AMOUNTS OF CYANIDE. Tekum Fonong, Illinois State University, Normal, IL 61761. The method is based on measurement of the absorbance at 460 nm of the Fe(III)-SCN complex formed from SCN^- produced in the enzyme-catalyzed reaction. The enzyme rhodanese (EC 2.8.1.1) catalyzes the reaction between CN^- and $S_2O_3^{2-}$ with stoichiometric formation of SCN^-. Linear calibration graphs were obtained in the range of 0-20 ppm CN^- in both aqueous and serum samples with a detection limit of 0.1 ppm. The precision of the method is better than 2.5% r.s.d. at 5 ppm CN^-. Only a small concentration of enzyme is required. Because there is practically no incubation period required for the enzyme reaction, the method is very rapid and it has potential for automation for the routine analysis of environmental as well as clinical samples.

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BIOCHEMICAL FUNCTIONS OF VARIOUS POLYAMINES: A REVIEW. J.P. Mathis, T. Fonong and J.C. Tsang, Department of Chemistry, Illinois State University, Normal, IL 61761. Polyamines are naturally occurring organic cations. These cations are ubiquitous to biological materials, with putrescine (+2), spermidine (+3) and spermine (+4) being the most common. The biochemical functions and roles of polyamines are varied and many. Polyamines stabilize, affect permeability of and are essential components of biological membranes. The stabilization and aggregation of ribosomes are caused by polyamines. In addition, polyamines bind to and stabilize DNA and RNA, thus increasing both RNA and protein synthesis. Normal cell growth is stimulated by polyamines. In rapidly growing cells or tissues, such as in malignancy, polyamines are found in high levels. The role of ornithine decarboxylase in the formation of polyamines in rapidly growing cells will be discussed.

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HYDROLYTIC EFFECTS OF POLYMYXIN B AND POLYAMINES ON WHOLE CELLS OF SERRATIA MARCESCENS. D.M. Barnett, J. Mathis and J.C. Tsang, Illinois State University Normal, IL 61761. Growth of some strains of Serratia marcescens has been shown to be inhibited by low concentrations of Polymyxin B (1.96 ug/ml); and the minimal inhibitory concentrations of various polyamines have also been reported. In this study, the lytic effects of Polymyxin B and various polyamines were analyzed on four strains of S. marcescens (08, OF, WF and 9-3-3). The deviation in cellular absorbance from the control was utilized to find the percent lysis at various concentrations of each drug. Polymyxin B was shown to lyse strain 9-3-3 and WF at relatively low concentrations (1.98 ug/ml and 62.5 ug/ml respectively) but showed little effect on strains 08 and OF. The sensitivity of strain 08 to the polyamines increased as the cationic charge decreased. The other strains showed no conclusive evidence of lysis with polyamines.

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PROSTAGLANDIN ACCUMULATION IN VITRO BY MOUSE UTERUS AND OVIDUCT S.Saffaripour and M.A. Jones, Departments of Chemistry and Biology, Illinois State University, Normal, Il. 61761. Uteri and oviducts from mice were collected at autopsy. The tissues were cut into segments, weighted, then incubated with [^{3}H] PGE_2 in 10 mM sodium phosphate buffer (pH=7.2). Bound and free ligands were separated by a filtration technique. Radioactivity was determined by liquid scintillation counting after dissolution of tissues in Beckman BTS 450 tissue solubilizer. PGE_2 accumulation by the uteri was evaluated as a function of incubation time, temperature, and reproductive state. The tissue to medium ratio (T/M) was calculated as dpm per 100 mg tissue divided by dpm per 100 microliters of incubation medium. The T/M ratio was greater than 1.0 for uteri as the time of incubation increased. The T/M ratio was significantly decreased in the uterine tissues in the presence of 100 fold excess of unlabeled PGE_2. These data suggest the presence of PGE_2 receptors in mouse uterine tissue. Also PGE_2 accumulation was observed in oviducts. (Supported in part by the ISU Research Grant Program)

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ANALYSIS OF PROTEINS OF THE DAY-SIX RABBIT OVIDUCT. M. Ostap and M.A. Jones, Illinois State University, Normal, Il. 61761, and M.J.K. Harper The University of Texas Health Science Center, San Antonio, TX. 78284. To evaluate potential protein changes as a function of the reproductive state, SDS-polyacrylamide gel electrophoresis(PAGE) was used to differentiate proteins by molecular weight. Oviducts were collected from day-six pregnant rabbits and stored at -80C until used. The proteins were scrapped from the internal surface of the oviduct into 10% SDS and solubilized using urea (9.4 M) and sulfuric acid (1 M). Two protein inhibitors, leupeptin and PMSF, had to be added before distinct protein bands could be observed in the SDS-PAGE. Six major protein bands, ranging from apparent molecular weights of 29,000 to 79,000 were observed. Using this system, protein composition can be evaluated as a reproductive function. (Supported in part by ISU research grant program)

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PROBLEMS OF TOXIC CHEMICAL USE, Chad Ziegler, Jeff Neaves, Anthony Mitchell, Black Hawk College, Moline, IL 61265.
Every year more and more toxic chemicals are introduced into the marketplace. Recent lab tests show certain compounds such as AETT cause undesirable effects in lab animals. In the case of AETT this involves nervous system damage and behavioral abnormalities. In this paper we will present some problems accompanying the use of toxic chemicals today.

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A GENERAL TWO STEP SYNTHESIS OF PYRROLIDINES. James R. McClure, Deborah A. Lill, and Joseph P. Haar, Southern Illinois University at Edwardsville, Edwardsville, IL 62026. A general two step synthetic sequence to prepare pyrrolidines has been developed. Initially, Michael addition of enamines to nitroethenes affords γ-nitroketones. Hydrogenation of the γ-nitroketones produces the desired pyrrolidines. Overall yields are in the range of 50 to 70%.

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NUMERICAL SOLUTION OF INITIAL VALUE PROBLEMS IN FLUID FLOW. S.K. Dey, Eastern Illinois University, and Charlie Dey, Charleston High School, Charleston, IL 61920. A predictor-corrector method has been developed to solve several flow models for compressible fluid. The predictor is generally a first order accurate difference equation and the corrector represents a convex mapping. The method uses a set of predetermined convex parameters which make the numerical solution stable. This has been verified by computer experimentations.

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GENERATING NUMERICAL SEMIGROUPS. C.G. Fleming and J.D. Halchin, Eastern Illinois University, Charleston, IL 61920. We will discuss a recursive computer program that generates all finite numerical semigroups. The program generates the semigroups according to their genus and can calculate the generators and weight for each semigroup.

-40-

PC GRAPHICS ANIMATION AND SCOTTISH COUNTRY DANCE INSTRUCTION. Jayne A. Schiek and Patrick Lamont. Western Illinois University, Macomb, IL 61455.
The presentation will describe the creation of software written in an advanced BASIC to run on an IBM PC to simulate the formations of 32 bars of a Scottish Country Dance. The software serves as an instructional aid helpful to the beginning dancer. Determining the type of representation to be used on the screen, analyzing the various figures to be simulated, and studying techniques of computer animation were among the many interesting facets of solving the problem.

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THE POTENTIAL ROLE OF COMPUTER BASED INSTRUCTION IN TECHNICAL EDUCATION AS RELATED TO THE"RETRAIN AMERICA" EFFORT. R.N. Woll, N. Woll and Company, Inc., San Jose, Illinois 62682. The author is involved as a member of the planning task force for a national program to increase American competitiveness. Of key importance in this program is the utilization of computer based instruction employing expert systems and artificial intelligence in the delivery of the courses. Projects will be cited as examples including work conducted at Boise State University in Idaho. The potential role of Illinois schools will be described and future plans for the overall project explained.

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DESIGN AND DEVELOPMENT OF A STORY GENERATOR. M. J. Meredith and D. Koga, Blackburn College, Carlinville, IL 62626. A student-written story-generating program will be presented. The program's structure and the approach taken to such problems as plot generation, following a plot, and the construction of semantically and syntactically reasonable sentences will be discussed.

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A CLASSIFICATION EXPERT SYSTEM. Kevin Derheimer and Patrick Lamont, Western Illinois University, Macomb, IL 61455. This paper discusses artificial intelligence and gives the code in LISP for a sample classification expert system that can be applied to any dichotomous classification strategy. Topics to be discussed include the basis for using computers to solve thought-based problems, the definition and background for expert systems, the programming language LISP, and the code of the expert system.

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NEW DESIGN TECHNIQUE FOR FIRST-ORDER COMPENSATOR. L. Youn, A. Godhwani, and J. Chen, Southern Illinois University at Edwardsville, Edwardsville, IL 62026. The conventional design technique for the control systems is based on a trial-and-error approach and the performance specifications are checked by analysis with each adjustment of parameters of a compensator. In the new design approach no trial-and-error procedure is needed since the compensator is found directly from the given specifications. The compensator has a unique form thus it is not necessary to distinguish whether the type of the compensator is lag or lead. The new design procedure is very effective and simple to use.

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A MEGAFAUNA FROM THE GROVE CHURCH SHALE (UPPER MISSISSIPPIAN) OF SOUTHERN ILLINOIS, G. H. Fraunfelter, Southern Illinois University at Carbondale, Carbondale, IL 62901-4324.

A new megafauna from the Grove Church Shale (Chesterian) was investigated as part of an on-going study of the Mississippian/Pennsylvanian boundary in southern Illinois. This megafauna, collected near Lick Creek in Union County, occurs about 1.2 meters below the lowest Pennsylvanian sandstone bed. The megafauna contains Amplexizaphrentis sp., Diaphragmus elegans, Echinoconchus alternatus, Orthotetes kaskaskiensis, "Batostomella" nitidula, a fenestrate bryozoan, Nucula sp., ?Nuculoidea sp., ?Nuculopsis sp., ?Parallelodon sp., Phestia spp., Pinna missouriensis, Straparollus (Euomphalus) cf. illinoisensis, S. (E.) sp., Straparollus (Straparollus) cf. spergenensis, Reticycloceras croneisi, a tainoceratid cephalopod, crinoid columnals, and Paladin sp. This megafauna, dominated numerically by bivalves and trilobites, is Chesterian.

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TWO BRYOZOAN FAUNULES FROM THE LATE PENNSYLVANIAN OF ILLINOIS. J.F. Stratton, Eastern Illinois University, Charleston, IL 61920, and A.S. Horowitz, Indiana University, Bloomington, IN 47401. Two bryozoan faunules occur in the top of the Livingston Limestone Member, Bond Formation and the base of the Mattoon Formation, Late Pennsylvanian (Missourian) at the Charleston Stone Quarry, Charleston, Illinois. The lower faunule is dominated by the small branching rhabdomesonid genus Rhombopora, which forms coquinoid lenses. The upper faunule is dominated by Polypora, which is dispersed in fossiliferous shales. Associated bryozoan genera include the cystoporids Fistulipora and Meekopora, the trepostome Tabulipora, and the fenestrates Fenestella (sensu lato) and Septopora. Two shale samples yielded 62-95% polyporan, 5-23% septoporan, and 0-15% fenestellid fragments. Fenestrate fronds are broken but unabraded; shales are dark and do not exhibit burrowing or disturbed textures. The environment of deposition is interpreted as relatively shallow, protected marine waters on the east side of the Lasalle Anticline, a low Pennsylvanian structural feature in the middle of the Illinois Basin.

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VARIABILITY IN TWO CONULARID SPECIES FROM THE LATE PENNSYLVANIAN OF ILLINOIS. K.A. Meyerholtz, Indiana University, Bloomington, IN 47401, and J.F. Stratton, Eastern Illinois University, Charleston, IL 61920. Occurrences of at least two conularid species occur in the middle shale member of the Livingston Limestone Member, Bond Formation, Late Pennsylvanian (Missourian) at the Charleston Stone Quarry, Charleston, Illinois. Two sets of characters were obtained from the conularid material. One set contains 93 multivariate characters representing structure and morphology of the exoskeleton. The second set contains 12 traditional counts, angle determinations, and linear measurements obtained from the exoskeleton. Analysis, utilizing univariate, bivariate, and multivariate techniques suggest two distinct species of conularids are present in the Livingston faunule. Generic assignment of the conularid specimens is indeterminate at this point. Further investigation of type material will be required.

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USE OF 87Sr/86Sr RATIOS IN TRACING GROUNDWATER FLOW PATHS INTO CEDAR BOG, OHIO. S. G. Price and P. Pushkar, Wright State University, Dayton, OH 45435. Cedar bog is a remnant of a Pleistocene swamp, characterized by a presumably constant flow of cold, infiltrating groundwater. Eighteen samples of local groundwater and seven samples of till were analyzed for 87Sr/86Sr in an effort to trace the provenance of the water. The results indicate that the local tills are not the source of strontium in the ground waters or the Cedar Bog waters. Rather, the ratios suggest that the source(s) of water are in older and deeper glacial outwash deposits or the underlying bedrock.

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EFFECT OF CRUSTAL THICKNESS ON MAGMA COMPOSITION: STUDY OF TWO CHILEAN VOLCANOES. N.J. McMillan, Dept. Geology/Geography, Eastern Illinois Univ., Charleston IL 61920. Two volcanic centers in Chile have been studied in order to examine the effect of crustal thickness on the compositions of subduction-zone magmas. Mocho-Choshuecno (MC), located in the southern Chilean active volcanic arc at 40°S latitude is situated on 35 km thick crust; Parinacota (P) is located in northernmost Chile (18° S) on 80 km thick crust. Parinacota lacks basaltic lavas (most mafic lava-MC: 52.5% SiO_2; P: 54.1% SiO_2), due to the presence of a thick crust which acts as a density filter, trapping dense magmas until they crystallize their dense components. Similarly, higher K_2O contents at Parinacota (MC: 0.5-2.6%; P: 2.3-4.4%) are a reflection of the larger amount of crust assimilated by rising magmas. Higher $^{87}Sr/^{86}Sr$ and lower $^{143}Nd/^{144}Nd$ ratios (MC: 0.7041 and 0.5128; P: 0.7068 and 0.5123) at Parinacota indicate the presence of older rocks in the thick crust of northern Chile.

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CHEMICAL EVIDENCE FOR CRUSTAL CONTAMINATION IN THE SOUTHERN VOLCANIC ZONE OF CHILE. J. Earle and N.J. McMillan, Department of Geology and Geography, Eastern Illinois University, Charleston IL 61920. Volcan Mocho-Choshuenco is a subduction-related volcano in the Southern Volcanic Zone of Chile that consists of basaltic, andesitic, and dacitic lava flows (SiO_2=52-68 wt.%). Comparison of calculated major and trace element fractionation paths from basalt to dacite with actual lava compositions indicates that fractional crystallization of the observed phenocryst minerals (olivine, plagioclase, augite) was not the sole differentiation process. Assimilation of rock enriched in K and Rb relative to Ba and La is required. Xenoliths of plutonic rocks found in the lavas and local exposed batholiths have appropriate major and trace element compositions and probably represent the contaminant.

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PETROGRAPHIC AND CHEMICAL EVIDENCE FOR MAGMA MIXING AT VOLCAN MOCHO-CHOSHUENCO, CHILE. E. Knoebl and N.J. McMillan, Department of Geology and Geography, Eastern Illinois University, Charleston, IL 61920. The youngest volcanic rocks of the Mocho-Choshuenco volcanic center in Chile form a small pyroclastic cone (Mocho) in the crater of a shield volcano (Choshuenco). Mocho bombs and lavas are andesitic to dacitic (SiO_2=57.5-66.5 wt.%) and fall on linear trends on chemical variation diagrams. Linear trends are an indication of magma mixing and cannot be produced by fractionation of observed phenocryst phases. Phenocrysts in some Mocho lavas have equilibrium textures and thus appear to have grown during simple cooling of the magma prior to eruption. However, other lavas contain resorbed plagioclase phenocrysts ± rounded olivine grains. Such disequilibrium textures indicate that crystal growth was interupted by a thermal event such as mixing of basaltic and silicic magmas.

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SR ISOTOPES AND MIGRATION OF OIL-FIELD BRINES FROM SILURIAN-DEVONIAN AND MISSISSIPPIAN STRATA IN THE ILLINOIS BASIN. A.M. Stueber, Southern Illinois Univ. Edwardsville, IL 62026 and P. Pushkar, Wright State Univ., Dayton, OH 45435. Research has continued on the use of radiogenic ^{87}Sr as a tracer of brine origin and evolution. Mean values of $^{87}Sr/^{86}Sr$ and Sr were determined for brines from each of 23 Silurian and Devonian oil fields. When $^{87}Sr/^{86}Sr$ is plotted vs 1/Sr, a linear relationship is observed. This demonstrates that these brines represent mixtures in various proportions of two different component solutions, one with a low isotopic ratio and high Sr content and the other having a much higher isotopic ratio and lower Sr content. These solutions are interpreted as formation water from Silurian-Devonian carbonate rock and formation water from the New Albany Shale Group. The latter formation water migrated, along with petroleum, into the carbonate units; mixing of the two types of water resulted in the present suite of brines. When $^{87}Sr/^{86}Sr$ is plotted vs 1/Sr for each of 16 Mississippian brines, a random distribution of data points is observed. Thus these brines are not the result of two-component mixing, and have evolved independently from the Silurian-Devonian brines.

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RECENT FINDINGS FROM THE VOLCANICLASTIC DEPOSITS AT KAKANUI, NEW ZEALAND. P.P. Sipiera, Harper College, Palatine, IL 60067. Found along the coastline of northeastern Otago, South Island, New Zealand are many exposures of Eocene and Oligocene-aged volcaniclastic deposits. One of the more significant sites is located around the mouth of the Kakanui River. Here numerous xenoliths and xenocrysts have been found, and are of particular interest due to their similarity to materials found in kimberlite pipes. In the present study, numerous xenoliths are xenocrysts have been examined and reveal a wide variety of lower crustal and upper mantle materials. Radiometric data on several of the xenocrysts place the majority within a range of 36.9 to 32.9 m.y., indicates the Kakanui eruptive events occurred at the Eocene-Oligocene age boundary. Stratigraphic analyses of the volcaniclastic deposits indicate that they are of mass-flow origin, and suggest a nearby source.

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EARLY PENNSYLVANIAN PALEOGEOLOGY AND PALEOTOPOGRAPHY OF ROCK ISLAND COUNTY, ILLINOIS. Richard L. Leary, Geolgy Department, Illinois State Museum, Springfield, IL 62706. Previous mapping of the Early Pennsylvanian erosional surface in Rock Island County, Illinois, revealed large areas of low relief, occassional hills up to 20 m high and valleys up to 60 m deep. Some possible karst features (blind valleys and large sink holes) were indicated. Surface exposures, including large quarries, also revealed large areas of low relief with meandering channels. Previous maps utilized about 800 drilling records. Using numerous wells drilled since the initial study, some key areas identified on the earlier map have been examined in detail. This study more clearly delineates some features, showing the extent of areas of low relief and dimensions of valleys and hills, but has not answered questions regarding relatioships of channels to valleys.

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ICE LOADING OF GLACIAL LAKE ILLINOIS SEDIMENTS, PERU, ILLINOIS. Robert S. Nelson, Illinois State University, Normal, IL 61761. Advance of glacial ice into glacial Lake Illinois is marked by ice marginal deltas, drop stones and Malden Till. Sixteen geotechnical borings provide data on the position of ice grounding along the north wall of the Lake. In deeper water, where the glacier was floating, the deltaic deposits are characterized as stiff ($Qu = 1.61 \times 10^4$ kg/m^2, $s=6.24 \times 10^3$, $n = 77$). Where the deltaic deposits were overridden by glacial ice the sediments are characterized as very stiff ($Qu = 3.68 \times 10^4$ kg/m^2, $s = 9.61 \times 10^3$, $n = 14$). The difference in unconfined strengths can be attributed to loading by 22.29 meters of glacial ice. This is consistent with ice thicknesses of 22.64 meters, based on the depth of water in glacial Lake Illinois. This ice thickness suggests that the local ice advance was the result of a surge.

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AMPHIBOLE-BEARING PHONOLITES IN THE BLACK HILLS, S.D. J.G. Kirchner, Illinois State University, Normal, IL 61761. Of the numerous Tertiary phonolite intrusions in the northern Black Hills, only the three eastern-most sites contain amphibole. Thin section, microprobe and XRD analyses indicate compositions consisting of phenocrysts of alkali feldspar-mantled plagioclase, slightly-sodic augite, and iron-rich pargasite amphibole in a groundmass of alkali feldspar, plagioclase, analcite, green clinopyroxene and minor nepheline. Whole-rock chemical analyses indicate increased amounts of CaO and divalent mafic constituents and lesser amounts of ferric iron, silica and alkalies, relative to the other phonolites. REE patterns show extreme enrichment of the LREE and strong plagioclase fractionation. A link between the "typical" phonolites and a mafic parent is suggested.

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ENVIRONMENT OF DEPOSITION OF THE HOUX LIMESTONE. T. K. Searight, Illinois State University, Normal, Il 61761. The Houx, a thin Middle Pennsylvanian limestone, was deposited in a narrow, shallow seaway in northeastern Missouri that connected the Forest City Basin with the Illinois Basin through St. Louis. The limestone is a fossiliferous wackstone with crudely stratified fragments of mega fossils. The fauna indicates that the water in the central part of the seaway was clear, warm, and free of turbidity. Bottom agitation is indicated by fragmented fossils and lack of bioturbation. Orientation of elongate grains indicates gentle currents moved over the bottom in a north-south direction.

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DELINEATING AN ABANDONED MINE TUNNEL USING VERTICAL ELECTRICAL SOUNDINGS AT A LANDFILL, VERMILION COUNTY, ILLINOIS. Philip C. Reed, Illinois State Geological Survey, 615 E. Peabody Dr., Champaign, Illinois 61820, and Charles E. Clark, Clark Engineering Service, 1317 Whittier Ave., Springfield, Illinois 62704. Abandoned mine tunnels in bedrock beneath refuse may adversely affect the operations of a landfill. Mine tunnels 20-35 feet below land surface were known to be present in a trench at the H & L Landfill near Danville, Illinois. The location of an abandoned mine tunnel at the H & L Landfill was determined by resistivity method in rocks consisting of shale, coal and limestone. The resistivity of earth materials is a function of void space and the chemical composition of the rock and pore water. Information developed from the geo-electrical study characterizing rock with coal, rock without coal and the mined out tunnel was correlated with test drilling to depths of 75.5 feet. This study suggests that resistivity techniques can be used at other sites to locate shallow water-filled mine tunnels.

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THE GEOCHEMISTRY OF THE STATEN ISLAND SERPENTINITE. Stephen D. York, Geology Student, Hofstra University, Hempstead, NY. 11550 The Staten Island Serpentinite is a body of rock located on Staten Island, New York. Looking at a geologic map of this region, the body of serpentinite located in Statent Island probably formed during the post-Ordovician period of the Paleozoic Era, approximately 435 million years ago. Geochemically analyzed, sepentinites contain approximately 42% Si, 40% Mg, and 16% H_2O. The other 2% consists of a combination of elements that do not effect the overall rock state. Trace element results reveal that serpentinites are not radioactive, and do not have much of an effect on the rock's overall state of matter, except to determine its relative age.

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THE SEDIMENTARY RECORD OF EUTROPHICATION IN TWO WASHINGTON LAKES
Richard B. Brugam. Department of Biological Sciences, Southern Illinois University, Edwardsville, IL 62026.
Diatom microfossils from the sediment of Pine and Otter Lakes in Washington show that both lakes have undergone considerable change over the last 50 years. Pollen analysis of the sediment show that the changes post-date the forest disturbance caused by the initial logging of the lake watersheds. The changes seem to be associated with the construction of recreational cabins and suburban homes around the lakes. This change occurred from the late 1940's to the present. The precise nature of the change seem to be unclear but seem to represent a moderate eutrophication of the lakes combined with a large increase in lake pH.

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PHYTOPLANKTON PRODUCTIVITY IN THE ATCHAFALAYA BASIN. J. Verduin, Department of Botany, Southern Illinois University, Carbondale, IL 62901. The swamps and bayous of the atchafalaya (southern Louisiana) were studied during 1975-77. The ratio of chlorophyll to total phosphorus was an order of magnitude lower than the mean in fresh water lakes (0.04 compared to 0.3). But the photosynthetic rate per unit of chlorophyll was three fold higher than the mean for freshwater lakes (over 1.0 millimole CO_2 fixed hourly per mg of chlorophyll, compared to 0.4). Respiration by the community exceeded photosynthesis by a factor of two (32 millimoles of CO_2 evolved per square meter per hour compared to 15 fixed by photosynthesis). The community is obviously digesting more organic matter than is provided by the photoplankton.

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ACID RAIN AND GROWTH OF FOREST TREES IN SOUTHERN ILLINOIS. C. C. Myers, Southern Illinois University, Carbondale, IL 62901. The Department of Forestry at SIU-C is cooperating in a study sponsered by the Illinois Department of Energy and Natural Resources to determine if tree growth in Southern Illinois has been effected by acid rain. This paper will present an overview of the study and describe data collected and analysis procedures.

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POTENTIAL FOR SILVICULTURAL HERBICIDES IN THE CENTRAL HARDWOOD FOREST REGION. W. Bristow*, G. Gaffney and D. Shenaut, Southern Illinois University, Dept. of Forestry, Carbondale, IL 62901. There is an ever-increasing interest in the central hardwood forest region for growing trees as an economic endeavor. Intensive forest management of conifers and hardwoods will be accomplished with the chemical control of competing vegetation. Most herbicides in use today were developed for intensive row crop agriculture. This technology and its transfer to the management of forests in the central states represents the future of forest management in the central hardwood forest region.

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POSTEMERGENCE WEED CONTROL IN PINE PLANTATIONS. D. Shenaut, G. Gaffney and W. Bristow. Southern Illnois University, Dept. of Forestry. Carbondale, IL. Studies have been inititated since 1983 to determine the effect of application date, age of crop species and herbicide rate on 1) competing vegetation and 2) herbicide tolerance exhibited by various pine species. These studies have been conducted on various cover types throughout southern Illinois. Pine species investigated include: eastern white pine, scotch pine and loblolly pine. Herbicides applied were experimental unnamed compounds as well as industry standards. Results to date have shoun a definite correlation between the amount of herbicide injury and application between the amount of herbicide injury and application date. In general older crop trees are more tolerant of herbicide application. There is also a species component. Some pine species remain undamaged while other species are killed by the same treatment.

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PSYCHOLOGICAL THEORIES AND RESOURCE MANAGEMENT. C.F. Donow and P.A. Yambert, Southern Illinois University at Carbondale, Carbondale, IL 62901. In our study of the relationship between development theory and environmental issues, we have interviewed resource managers about how they have solved specific problems in their regions. By analyzing their responses, we devised some practical applications of psychological theories which may supplement managers' repertoire of problem-solving techniques. These applications involve predicting public opinions and reactions, and suggestions on how to phrase public information. Psychological theories and suggested applications which will be discussed are those on motivation, moral development, values and attitudes, and agentic versus communal statements.

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ENDANGERED SPECIES AND ENLIGHTENED LIFESTYLES. P. A. Yambert, Southern Illinois University, Carbondale, IL 62901. The collective impacts of John and Joan Q. Public's lifestyles have vastly greater influence on the survival or extinction of endangered wildlife species than the collective efforts of professional wildlife managers. In this study, the more significant of these lifestyle impacts are identified and assessed. Specific criteria for evaluating individual lifestyle components in this context are then proposed.

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EVALUATION OF PLATELETS IN BOVINE BLOOD AS A FUNCTION OF THE REPRODUCTIVE STATE OF THE ANIMAL. S. K. Hardesty, M. A. Jones, Department of Chemistry, and C. L. Moore, Department of Agriculture, Illinois State University, Normal, IL. 61701-6901. After the transfer of fertilized mouse ova, thrombocytopenia has been demonstrated to be an initial maternal response during the pre-implantation phase of pregnancy. This information is potentially significant as an early monitor of embryo transfer survival. Therefore, we have developed a protocol involving the use of cattle as a more economically relevant model system. Blood was collected into EDTA vacutainer tubes from the tail vein of control and hormonally-stimulated cows. Analysis of the hematological parameters (RBC, WBC, platelets, hematocrit and Hb) was performed using standardized instruments found in clinical labs. Statistical methods were used to establish a normal range for each cow, evaluate the methodologies used, and highlight the significant differences between the cows. Future experiments will be performed to establish the final protocol necessary for blood evaluation following embryo transfer. (Supported by the ISU Research Grant Program).

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ALPHA-1-ANTITRYPSIN CONCENTRATIONS IN LUNG LAVAGE SAMPLES. P.A.Reidy and M.A.Jones, Illinois State University, Normal,IL 61761. Enzyme inhibitors such as alpha-1-antitrypsin, play a major role in the protection of the lung from enzyme induced damage. We hypothesized there may be a link between aging and a decrease or inactivation of the inhibitor because of the high number of emphysema cases which occur in the elderly. Our objective was to develop an appropriate lavaging technique to extract lung fluid in order to test for the presence and amount of alpha-1-antitrypsin in mouse lung. Lungs were lavaged with ice cold Kreb's Ringer buffer. The lavage was stored at -20C until monitored for total protein by the method of Lowry et al. (1951). The amount of trypsin and alpha-1-antitrypsin in lavages was determined using Benzoyl-L-Arginine Methyl Ester as the substrate for the enzymic reaction. In preliminary trials, The minimum concentration of inhibitor needed to show a decrease in the rate of reaction was 7.5×10^{-6} g/ml. This technique will now be applied to mice of varying ages. (Supported in part by the ISU Research Grant Program)

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POTENTIATION OF MACROPHAGE FUNGICIDAL ACTIVITY FOR CRYPTOCOCCUS NEOFORMANS BY LYMPHOKINES. Amy P. Browning and Dennis J. Kitz, Southern Illinois Univ. at Edwardsville, Edwardsville, IL 62026. The interactions of cultured murine macrophages (MØ) and the yeast Cryptococcus neoformans were studied. MØ were obtained from bone marrow and lungs of AKR/J mice, and maintained in culture in a growth medium which selects for cell lines retaining MØ characteristics. Both pulmonary and bone marrow-derived MØ cell lines readily phagocytize C. neoformans via their C3 receptors, and can inhibit the growth of intracellular yeasts. Killing of intracellular yeasts can be induced by depriving the MØ of colony-stimulating-factor for several weeks before their exposure to priming lymphokines and triggering lipopolysaccharide (LPS). Lymphokines were obtained from concanavalin A stimulated murine spleen cell suspensions, or recombinant tumor necrosis factor and interferon-gamma (generously provided by Genentech, Inc.). Current studies are involved in utilizing lymphokines to provide in vivo protection in mice challenged with C. neoformans. This work was supported by a grant from the American Lung Association.

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ANTIBIOTIC-MEDIATED ENHANCEMENT OF MURINE IMMUNE RESPONSE BY CLINDAMYCIN AND LINCOMYCIN. Herbert R. Neuman and Dennis J. Kitz, Southern Illinois University at Edwardsville, Edwardsville, IL 62026. The effects of two antibacterial antibiotics, clindamycin and lincomycin, on murine immune response were examined. Both drugs were found to enhance in vitro killing of Candida spp. by bone marrow-derived, cultured murine macrophages at concentrations as low as 12.5 ug/ml. Clindamycin also was found to effect in vivo growth of Candida spp. as measured by a reduction in colony-forming-units present in organ homogenates (spleen, liver and kidney) of drug-treated mice compared to untreated mice four days after their having received an intravenous challenge with the yeasts. In addition, it was discovered that in vivo contact sensitivity to dinitrofluorobenzene and oxazolone was enhanced by the administration of either drug to AKR/J mice at the time of initial sensitization, as determined later by ear-thickness measurements. These findings demonstrate that clindamycin and lincomycin may have a number of potentially beneficial effects on host immune response to infection. This work was supported by a grant from the Upjohn Company.

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LECTIN BINDING AFFINITY IN NORMAL SKIN AND BENIGN, PREMALIGNANT, AND MALIGNANT CUTANEOUS LESIONS, A. Armin, R. Gradini, P. D. Toto, H. Nadimi, A. M. Eng, R. Martinez, Loyola University of Chicago, Maywood, IL. 60153. The binding site of Con A and RCA-I in normal skin, seborrhreic keratosis (SK), actinic keratosis (AK), Bowen's disease (DB), squamous cell carcinoma (SCC), and basal cell carcinoma (BCC), were studued by using avidin-biotin-peroxidase technique. Normal skin showed a binding site predominatly located on the cell membrane of stratum spinosum and becoming stronger toward

stratum corneum. SK revealed lack of reactivity in basaloid cells. In AK the reactivity was present in the area of dyskeratosis, but wasabsent in the atypical rete ridge. BD as well as BCC showed lack of reactivity. SCC showed different pattern of positivity, with strong reaction in well differentiated areas, and weak positivity in foci of less differentiation. We conclude that binding affinity for Con A and RCA-I corresponds to the degree of squamous differentiation.

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ULTRASTRUCTURE OF THE C57 MOUSE ANTEROVENTRAL COCHLEAR NUCLEUS. W. E. Briner, J. F. Willott and L. Hanzely, Northern Illinois University, DeKalb, Il. 60115. The anteroventral cochlear nuclei (AVCN) of 2mo. old C57BL/6J mice were examined ultrastructurally to identify cell types. Bushy and stellate cell types were identified using the criteria established for the cat. Bushy cells were shown to be characterized by perinuclear ER cisternae and numerous terminal oppositions, including cochlear endbulbs. Stellate cells had no perinuclear ER cisternae and few terminal oppositions. Compared to stellate cells, bushy cells had more and larger terminals, a greater cytoplasmic volume, round nuclei in profile, and more of the cell volume occupied by mitochondria. The anatomy of the mouse AVCN is similar to that of other mammals examined.

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ULTRASTRUCTURE OF THE ANTEROVENTRAL COCHLEAR NUCLEUS OF THE C57 MOUSE- EFFECTS OF AGE AND HEARING LOSS. W. E. Briner, J. F. Willott, and L. Hanzely, Northern Illinois University, DeKalb, Il. 60115. The C57Bl/6J mouse is a model of age related hearing loss (presbycusis). The anteroventral cochlear nuclei (AVCN) of 2mo. and 24mo. old C57 mice were prepared for electron microscopy, the neurons examined and age groups compared. Older cells were found to have smaller nuclei with an increase in heterochromatic material and frequent invaginations of the nuclear envelope. Fewer old cells were found with perinuclear cisternae. The plasmalemma of the older neurons was opposed by fewer terminals and less of the cytoplasm was occupied by mitochondria. Older cells contained more and larger lipofuscin particles. The percentage of the neuron opposed by terminals and the percentage of the cell occupied by mitochondria demonstrated a significant positive linear relationship across ages. Older AVCN neurons undergo significant morphologic changes in presbycusic mice.

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USE OF A MICROMETHOD TO STUDY OPTIC NERVE PROTEIN OF AGING RATS. A.S. Jacks, A.G. Richardson, C.T. Wismer, M.A. Jones, Dept. Chemistry, Illinois State University. Proteins are an important part of the myelin membranes of nerves. Since the amount of protein in brain myelin has been demonstrated to increase during development, we were interested in evaluating the amount of protein in rat optic nerves as a function of age. For this study, optic nerves were removed from rats of different ages (2 and 22 months). After homogenization of individual optic nerves using a miniaturized homogenization apparatus, myelin and non-myelin proteins were separated using differential sucrose gradients (final volume of 100 microliters centrifuged at 25,000 xg, for 15 min at 4 C). Proteins were measured using the method of Lowry et al.(1951). Total myelin protein per nerve at 2 and 22 months of age was 3.00 $\pm$1.51 ug and 184.86 $\pm$ 52.12 ug respectively. Non-myelin protein for rats at 2 months of age was 117.67 $\pm$ 55.17 ug per nerve. These data suggest that the amounts of myelin and non-myelin protein do vary as a function of age. (Supported in part by ISU Research Grant Program).

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THE ROLE OF A MANNOSE RECEPTOR IN MACROPHAGE UPTAKE OF CANDIDA ALBICANS. Dennis J. Kitz and Donna Kay Wohlfeil, Southern Illinois University at Edwardsville, Edwardsville, IL 62026. Receptor-mediated uptake is employed by many cell types for selective uptake of macromolecules from the extracellular environment. Mannose-fucose receptors of macrophages (MØ) have been demonstrated to perform such functions, and also appear to mediate attachment and uptake of microorganisms such as Candida albicans which possess mannose residues in their cell wall. Soluble mannose binding protein (MBP) obtained by affinity chromatography from rabbit serum (and analogous to the MØ mannose receptor), inhibits uptake of C. albicans at levels as low as 5.0 ug/ml, and the MBP inhibitory effect can be blocked by yeast mannan. Also, pretreatment of either the yeast or MØ with MBP prior to assay blocked uptake of the yeast suggesting that both cell bound and soluble mannose receptors may modulate MØ-Candida interactions. This work was supported by a research grant from the American Heart Association-Illinois Affiliate.

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EFFECTS OF DIETARY FATS ON SERUM TOTAL CHOLESTEROL OF MICE. E.C. Beyers and J.M. Johnson, Department of Home Economics, and M.A. Jones, Department of Chemistry, Illinois State University, Normal, Il 61761-6901. Dietary fat has been implicated as an important risk factor in coronary heart disease through its effects on the blood serum cholesterol. This study compared the effects of four types of dietary fats on the serum total cholesterol of mice. A modified diet of 1% corn oil with 4% of beef fat, olive oil, safflower oil, or fish oil was fed to four groups of six male mice for 66 days. Serum total cholesterol levels were enzymatically assayed. The levels of cholesterol for the test diets in decreasing order were beef fat, olive oil, safflower oil, and fish oil. Mice consuming the fish oil diet had a significantly lower mean serum cholesterol level ($P<0.01$) than the other groups. Fish oil merits more investigation as a means to lower cholesterol in man. (This research was supported in part by ISU Research Grant Program.)

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DEVELOPING DRUG TESTING CAPABILITIES. E.F. Jason and H.L. Dapron, Southern Illinois University, Edwardsville, IL 62026. Drug abuse is a national problem. College campuses are not exempt from this problem. Considerable attention has been given to establishing drug screening programs for college athletes. A questionnaire to college campuses about drug screening programs yielded important information regarding their status nationally. Literature studies of six major drugs of abuse provided information pertaining to metabolites and appropriate methods of analysis. Components of a drug testing program such as sample collection, chain of custody, legal and disciplinarian actions, and methods of analysis are presented.

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A REDUCTION IN THE RATE OF BLOOD PRESSURE ELEVATION IN SPONTANEOUSLY HYPERTENSIVE RATS (SHR) THROUGH AN EXERCISE PROGRAM. R. Crowell, R. Bartow and S. Cardoso, Blackburn College, Carlinville, IL 62626 and UTCHS, Memphis, TN 38163. Earlier work has demonstrated that the increase in systolic blood pressure (BP) of SHR shows a consistent pattern beginning shortly after 4 weeks of age. Other work has demonstrated the effectiveness of exercise in lowering established hypertension in both man and rats. The current study used 2 matched groups of 5 week old SHR males. 9 SHR were trained to swim and 9 were maintained as controls. The rats swam a total of 19 days over a 4½ week period. The first week total time was 13 hours increasing to 26 hours the last week. At the end of the swimming period the BP of the controls (179.8 ± 4.6 SEM) was significantly ($T=3.99$) higher than that of the swimmers (157.4 ± 3.23). The hematocrits of the controls (50.1 ± 0.82) were also significantly ($T=3.38$) higher than that of the swimmers (45.6 ± 1.05). After 2 weeks of rest, the BP of the 2 groups was the same (Swimmers 186.4 ± 4.1:Controls 186.6 ± 3.8) and the swimmers hematocrit elevated (46.9 ± 0.63)

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EFFECTS OF ACUTE UNDERWATER (ANAEROBIC) SWIMMING INTENSITY ON PLASMA LEVELS OF CORTICOSTERONE, CREATINE PHOSPHOKINASE (CPK) AND LACTIC DEHYDROGENASE (LDH) IN MALE RATS. A. M. Garcy. Chicago State University, Chicago, IL 60628. Stress from underwater swimming (UWS) was determined in 36 male rats separated into the non-swimming (NS), 1, 10, 17, 24 and >24 repetitions of UWS groups. Mean plasma levels of corticosterone in the 1 ($\bar{x}\pm$SE: 645±180 ng/ml), 10 (638±94 ng/ml), 17 (582±49 ng/ml), 24 (618±17 ng/ml) and >24 (519±66 ng/ml) repetitions of UWS groups were significantly ($P<0.05$) greater than in the NS (193±70 ng/ml) group. Mean plasma levels of CPK in the >24 (1414±270 U/L) repetitions of UWS group were significantly ($P<0.05$) higher than in the NS (3568±229 U/L), 1 (3564±473 U/L), 10 (2065±236 U/L), 17 (2520±227 U/L) and 24 (2479±379 U/L) repetitions of UWS groups. Mean plasma levels of LDH in the >24 (1631±452 U/L) UWS group were significantly ($P<0.05$) elevated above the NS (702±143 U/L), 1 (685±137 U/L), 10 (603±139 U/L), 17 (483±142 U/L) and 24 (673±50 U/L) repetitions of UWS groups. These data suggest that one period of light to exhaustive anaerobic exercise illicits tissue and body stress responses.

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Medicinal Plants of Illinois - The Wildflowers. C.B. Lewandowski, M.L. Quinn, and N.R. Farnsworth. University of Illinois at Chicago, College of Pharmacy, P.O. Box 6998, Chicago, IL 60680. Long before the white man traversed the rivers and lands of Illinois, the Indians were using the abundant prairie and woodland wildflowers in the practice of traditional medicine. The pioneers who passed through and the early settlers introduced European species which became naturalized (established) and were incorporated into traditional medicine. Many of these plants today appear on the Endangered or Threatened Species of Illinois list. Ethnobotanical uses by the natives and settlers of Illinois will be correlated with pharmacological studies. Among the genera to be discussed are Asclepias, Stachys, Echinacea, Solidago, Sambucus and Polygonum.

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PREPARATION OF A MODERATE HALOPHILE, HALOBACTERIUM VOLCANII, FOR SEM STUDY. Larry Kepple, SIU, Carbondale, IL., 62901. Lifelike preparation of a moderate halophile is difficult because of high salt requirements. 2 6M NaCl, 1 5M $MgCl_2$, 0.4M $CaCl_2$ and 0.4M KCl were present in the media used. Less salt caused morphological changes visible at low magnification. A protocol was developed for SEM examination of these cells using 4M NaCl as a rinse. Cells were photographed live, attached to poly-L-lysine coated slides, under phase contrast, fixed in situ, dehydrated, critical point dried, sputter coated with 300 A Pd/Au and viewed in a Hitachi S-570 SEM. Comparison of photos at 1000X revealed only slight changes interpreted as being due to shrinkage because of drying. Therefore, use of this technique is expected to allow lifelike imaging at higher magnifications.

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ELECTRON MICROSCOPY OF SUDDEN DEATH DISEASE OF SOYBEANS (SDS). J.J. Bozzola, J. Yopp, M. Krishnamani, J. Richardson and Oval Myers, Southern Illinois University, Carbondale, IL. 62901. SDS is a newly recognized potentially devastating disease of soybeans that appears to be spreading. It has appeared in seven states and thousands of acres are involved. Control and affected soybean plants showing SDS symptoms were processed for EM in late October, 1985. Scanning electron microscopy of leaf lesions located near conducting vessels showed the epidermal cells had undergone shrinkage up to 50% of normal whereas cells outside of lesions were unaffected. Cross sections of diseased stems revealed 20-30% of the xylem elements were plugged with 3-5 nm wide fibrillar material associated with dense glubular amorphous 80-120 nm particles. Unaffected plants lacked the occlusions. Blockage of water conducting vessels appeared to be associated with progression of the disease.

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EFFECTS OF ZINGIBERACAE RHIZOME EXTRACT ON THE INFECTIVITY OF CYANOPHAGE LPP-1 M.A.Dean, A.S.Dhaliwal, and W.R.Jones. Department of Biology, Loyola Univ. of Chicago, 6525 N. Sheridan Rd., Chicago, IL 60626. Plectonema boryanum and Lyngbya sp. were grown in Bold's medium under 175 ft-candle flourescent light. Three week old cultures were inoculated with 0.5 ml of purified LPP-1 virus and harvested five days later when the cells were lysed. Virus was partially purified by centrifugation and diluted with $MgCl_2$ salt solution. Virus dilutions used to test the ginger extracts gave control plaque counts of 100-150 PFU. Virus and ginger extract mixture was incubated at room temp. for various time intervals and then plated with cyanobacteria to check the inhibitory action of the extract on the virus. Samples were also prepared for examination by electron microscopy using several cationic molecular probes to elucidate changes in the algal cell surface. Evidence provided by the viral plaque counts and study of the electron micrographs strongly suggests that the ginger extracts have inhibitory effects on the infectivity of the LPP-1 cyanophage.

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A STRAIN OF XANTHOMONAS MAY CAUSE SUDDEN DEATH DISEASE OF SOYBEANS (SDS). J.J. Bozzola, J. Yopp, M. Krishnamani, J. Richardson and Oval Myers, Southern Illinois University, Carbondale, IL. 62901. SDS infected and normal field grown soybeans were collected and stems surface sterilized in 2% $HgCl_2$. Stems were split with a sterile scalpel and pressed onto various nutrient agars. Stems were also subjected to Scholander bomb pressure and exudates streaked onto nutrient plates and cultured at 22 and 35 C. Three types of colories emerged from both sampling methods; however, only one appeared to cause the characteristic symtomology in plants. These 0.7 mm, transluscent yellow colonies were glistening, raised and with entire borders. The organisms were 0.5 x 1.0 to 1.5 um gram negative rods that grew rather slowly. Pure cultures were used to infect healthy plants, the organisms were again re-isolated and pure cultures used to again induce the symptomology. These organisms fit most of the criteria for Xanthomonas campestris and may be one of the organisms causing SDS.

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ENCEPHALOMYOCARDITIS VIRAL INFECTION IN HUMAN ERYTHROLEUKEMIC CELLS (K562). M. Hart and P. Wanda, Southern Illinois University, Edwardsville, IL 62026. Glycophorin A, isolated from human erythrocytes has been identified as receptor substance for encephalomyocarditis (EMC) virus. We report here, the use of a human erythroblastoid cell line, K562, as an ideal human host cell system for EMC virus production. Unique to this system is the expression of glycophorin A and the induction of erythroid differentiation (hemoglobin production) after addition of 45 μM bovine hemin. Hemoglobin production was determined by benzidine staining of cells and reached maximum levels (80%) in 3-4 days following induction. EMC virus was added to induced and non-induced cells and at 24 hours post-infection (p.i.) both cultures showed characteristic cytopathic effects. At 60 hours p.i., the induced cultures showed complete cell destruction and plaquing in Vero cells showed maximum virus production. Viral replication appeared not to interfere with hemoglobin synthesis.

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CURRENT TRENDS IN INTERNATIONAL TRAINING AND EDUCATION IN THE TECHNOLOGIES. R.N. Woll, N. Woll and Company, Inc. San Jose, IL 62682. The rapid development of in-country capability for delivering technical education and industrial training in developing nations suggests a review of strategies of international technology transfer and the development of new approaches. A more complete and detailed articulation effort should be undertaken to enhance the overall efficiency of the program planning and development process. Such strategies will be discussed and new innovations in instructional delivery will be described.

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EXPECTATIONS OF COMMUNITY COLLEGE INSTRUCTORS ABOUT COLLEGE FRESHMEN CHEMISTRY STUDENTS. Tony Mitchell, Black Hawk College, Moline, IL 61265. A survey of 316 faculty was taken to find what they considered important for freshmen chemistry students to know before taking college chemistry. A comparison of results obtained from high school, community college, and college/universtiy faculty shows expectations vary among the groups. Results show community college instructors differ greatly from the university and college faculty on seven of ten selected questions. In all ten questions, community college faculty differed from high school faculty.

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A PROCESS APPROACH TO TEACHING FUNDAMENTAL SCIENCE CONCEPTS TO ELEMENTARY EDUATION MAJORS. Virginia Carter, Brian Shmaefsky, David Winnett, and Fred Zurheide, Southern Illinois University, Edwardsville, IL 62026. Evaluation of a course designed 1) To foster a positive self-image in students by increasing their ability to understand scientific material. 2) To instill fundamental understanding of the process skills as outlined by Science: A Process Approach (SAPA). (Reference: American Association for the Advancement of Science) 3) To instruct students in some basic concepts in biology, chemistry, and physics while presenting science as an integrated whole. 4) To acquaint students with the development of science projects.

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PREDICTION OF RICE RAT DISTRIBUTION IN SOUTHERN ILLINOIS USING A GEOGRAPHIC INFORMATION SYSTEM. W.U. Brigham, J.E. Hofmann and J.E. Gardner, Illinois Natural History Survey, Champaign, IL 61820. The marsh rice rat, Oryzomys palustris, is known from only a few locations in southern Illinois. The Illinois Geographic Information System was used to identify potential rice rat habitat. Localities of rice rat captures within a frequently sampled 7.5-min by 15-min quadrangle were superimposed on high-resolution spatial data, including surface hydrology, topography, soil type, vegetative cover and land use, to define attributes common to these sites. Captures typically were associated with permanent palustrine wetlands with emergent or scrub/shrub vegetation, stream traces, roads, and railroads. The model for rice rat habitat based on this specific area was extrapolated to 16 southern Illinois counties to predict the potential distribution of this species.

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NESTING REQUIREMENTS OF LOGGERHEAD SHRIKES (LANIUS LUDOVICIANUS) IN SOUTH-CENTRAL ILLINOIS. B. E. Lane and L. B. Hunt, Eastern Illinois University, Charleston, IL 61920. Nesting studies of the Loggerhead Shrike (Lanius ludovicianus), a threatened species in Illinois, were conducted in Clay and Wayne Counties from March to August, 1986, to evaluate habitat needs. Of 31 nests along a 130-km roadside route, 20 were successful with a mean brood size of 4.0. Failures were due to predation, fire and habitat destruction. Data for each nest included vegetative substrate, nest height, and distances to landscape features considered important to nesting shrikes. Land use practices in a 4-ha area around each nest were assessed to determine available foraging space. Most successful nests were above 3 m in conifers, were within 100 m of occupied buildings, highlines and impaling sites, and were in areas containing at least 50% short grass cover used for foraging.

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DENSITY OF CERTAIN BREEDING RAPTOR POPULATIONS IN SOUTHERN ILLINOIS. Phillip T. Hughes, Governors State University, University Park, IL 60466. From October, 1983 through May, 1985 breeding populations of the Red-shouldered Hawk (Buteo lineatus), Broad-winged Hawk (B. platypterus), Red-tailed Hawk (B. jamaicensis), American Kestrel (Falco sparverius), Great-horned Owl (Bubo virginianus), and Barred Owl (Strix varia) were censused in selected portions of Jackson and Williamson counties to determine densities of pairs. The results (pairs/sq. km.) were: Red-shouldered Hawk, .01; Broad-winged Hawk, .02; Red-tailed Hawk, .22; American Kestrel, .08; Great-horned Owl, .11; and Barred Owl, .32.

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STATUS OF THE PALLID CHUB, HYBOPSIS AMNIS, A RARE ILLINOIS FISH. Thomas J. Kwak, Illinois Natural History Survey, Champaign, IL 61820. The Pallid Chub, Hybopsis amnis, a minnow thought to have been extirpated from Illinois, was consistently collected from the Kankakee River in Will County in annual samples from 1978-1986. Specimens were collected in areas of the river with lentic characteristics including negligible flow and a sand-silt substrate. H. amnis was sampled in seine hauls with 45 other fish species, but preferred habitat most similar to that chosen by Pimephales vigilax and P. promelas. Reidentification of 58 specimens of the Illinois Natural History Survey fish collection from H. amblops to H. amnis has expanded the historic distribution of this fish.

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SEVEN YEAR STUDY OF THE EFFECTS OF PHOTOPERIODS ON THE CIRCANNUAL RHYTHM OF THE GERBIL. J. J. Natalini, Quincy College Quincy, IL 62301. The locomotor activity of groups of 6 male Mongolian gerbils was maintained under four photoperiods, LL, 12L:12D, 18L:6D and 6L:18D. The consecutive experiments lasted from 18 to 30 months with different animals used for each study. The light intensity was 2.2 lux; ambient chamber temperature was 20 ± 2^{0}C with no seasonal correlation. Maintenance was kept at a minimum, and food/water were provided ad libitum. The composite curves for each experiment had High(s) statistically significant from the Low(s) ($P << 0.001$, Student's t test). The frequencies for each circannual rhythm varied with the different photoperiods. Thus, the light/dark cycle acts as a Zeitgeber for the circannual rhythm of the gerbil. Circannual rhythms are known to exist in humans with the LD cycle acting as a potential Zeitgeber, also.

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AQUATIC MACROINVERTEBRATES AS INDICATORS OF WATER QUALITY IN THE CACHE RIVER DRAINAGE. M. Ann Phillippi, Southern Illinois University, Carbondale, IL 62901. Twenty-three sites in the Cache River drainage in Johnson and Pulaski cos. were surveyed for aquatic fauna, including aquatic macroinvertebrates. Over 20,000 invertebrates were captured representing over 230 aquatic or semi-aquatic taxa. The number of taxa per site ranged from 15-66 with the highest species diversities generally in the least disturbed areas (H'-0.170-1.131). Generally, at the disturbed sites with high number of individuals and low H', there was also a relatively high species dominance (1-0.109-0.880). Excessive habitat destruction resulting from drainage modification and/or sedimentation from agricultural activity was found at many sites. The integrity of areas protected by state and/or private agencies such as Eagle Pond, Long Reach, and others, were found to be seriously threatened by excessive siltation which is obliterating available aquatic habitat. This research was funded by the Nongame Wildlife Conservation Fund and Southern Illinois University, Carbondale.

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DEVELOPMENTAL REGULATION OF ARGININE KINASE IN DROSOPHILA. J.M. James, Eastern Illinois University, Charleston, IL 61920. Arginine kinase (AK) catalyzes the reversible formation of ATP and L-arginine from ADP and arginine phosphate, and is particularly abundant in indirect flight muscles of insects. The distribution of arginine kinase activity among tissues of larvae, prepare and adults, and a detailed developmental profile of AK activity were determined. A prepupal peak of AK activity has been localized primarily to imaginal discs. The prepupal peak of activity appears to be under control of ecdysone, since it is not seen in the temperature - sensitive mutant, ecd-1 raised at 29°C, but reappears when ecd-1 either is shifted to 20°C after 60 hours at 29°C or fed ecdysone. The gene for AK may be one of a class of genes which respond indirectly to ecdysone by way of "early" gene products, since various dosage levels of the 75B "early" gene affect AK activity. In imaginal discs the AK gene may be a target gene, probably regulated by the product of the 75B ecdysone - regulated "early" gene.

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MORPHOLOGICAL ASYMMETRY WITHIN THE COLONS OF HETEROMYID RODENTS: A POSSIBLE CORRELATION WITH HABITAT. G.L. Forman, Rockford College, Rockford, Illinois 61108. The mucosa, submucosa, and muscularis of the proximal colon of New World kangaroo rats and pocket mice are modified on the dorsal (mesenteric) side of the bowel. Features which characterize the modified mucosa in three genera (Dipodomys, Perognathus, Chaetodipus) from desert habitats include reduced goblet cells, pits at the luminal surface of colonic glands, and a thickened surface columnar (absorptive) epithelium. Several desert-adapted, and one mesic-adapted species have elongate colonic glands which project into the intestinal lumen upon a large typhlosole-like fold. Colons of this form are unknown in other rodent groups. Modifications of the colon are discussed in relation to possibly enhanced water retention.

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POSSIBLE USE OF FINE STRUCTURAL DETAILS OF SPERMATOZOAN TAILS AS AN AID IN ESTABLISHING ANURAN PHYLOGENY. W.S. James, Eastern Illinois University, Charleston, IL 61920. The presence of dense filaments within the tail of the spermatozoa of a primitive frog, Ascaphus truei, may be correlated with internal fertilization. Similar fine structural filaments are found within the tails of spermatozoa from an anuran family group in which some putative primitive members employ internal fertilization. In contrast these filaments are absent from the spermatozoa which have been examined from family groups in which only external fertilization is known. It is suggested that the diversity of fine structural details of spermatozoa may provide evidence for establishing a more satisfactory anuran phylogeny.

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CHARACTERIZATION OF AXOLOTL ACID HYDROLASES INVOLVED IN REGENERATION. M. Mandala and W.L. Daniel, University of Illinois, Urbana, IL 61801. Axolotl (Ambystoma mexicanum) limb regeneration requires extensive tissue restructuring mediated by a number of acid hydrolases. We have characterized arylsulfatase, beta-glucuronidase(GUS), and beta-galactosidase(GAL) extracted from axolotl liver in preparation for studies of the roles of these enzymes in limb regeneration. The properties of axolotl arylsulfatase strongly resemble those of mammalian arylsulfatase B; however, unlike the mammalian enzyme, axolotl arylsulfatase is moderately inhibited by NaCN and is thermolabile at 50-55C. Axolotl GUS and GAL also possess many properties characteristic of their mammalian counterparts; however, both enzymes tend to be more thermolabile than the respective mammalian enzymes.

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RATES OF SYNTHESIS AND CLEARANCE OF MURINE HEPATIC ARYLSULFATASE B. W.L. Daniel and L.A. Westfield, University of Illinois, Urbana, IL 61801. Murine hepatic arylsulfatase B was purified to homogeneity, and a polyclonal monospecific antiserum was raised in New Zealand White rabbits. In vivo rates of synthesis and clearance were estimated following intraperitoneal injection of tritiated leucine by monitoring incorporation of label into immunoprecipitable enzyme and total protein. Incorporation of label into arylsulfatase B was evident by 2h post-injection, attained a maximum at 8h, and was rapidly cleared (t 1/2 = 4h) from the arylsulfatase B pool. Purified enzyme protein was partially sequenced, and a mixture of 64 moderately degenerate oligonucleotide probes was synthesized. These probes were used to screen a murine liver cDNA library, and seven positive clones were recovered and are currently being analyzed.

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TOXIC EFFECTS OF GOSSYPOL ON ULTRASTRUCTURE OF RAT HEART MITOCHONDRIA. L.C. Pan, D.R. Jensen and M.J. Nadakavukaren, Illinois State University, Normal, IL 61761. Sexually mature male Holtzman rats were treated daily for 60 days with gossypol acetic acid at a dosage of 20 mg/kg body weight by gastric intubation. Heart tissue from the left ventricle was sampled from both treated and control animals and was prepared for electron microscopic examination using standard procedures. In general, the tissue from the treated rats appeared similar to that of the control except for the mitochondria, in which striking differences were apparent. The structural alterations in some of the mitochondria from the gossypol-treated rats included a loss of electron density in the matrix, swelling and disruption of cristae, and a complete loss of internal structure.

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THE PINEAL AND TESTICULAR HORMONE RECEPTORS IN SYRIAN HAMSTERS. A.G. Amador and A. Bartke, Southern Illinois University School of Medicine, Carbondale, IL 62901-6512.
Juvenile Syrian hamsters were treated for twelve weeks with melatonin, 5-methoxytryptamine, or were pinealectomized. Treatment with melatonin, but not with 5-methoxytrytamine, decreased testes weight and LH receptor levels. Both indoles decreased the levels of prolactin receptors. Pinealectomy decreased the levels of LH receptors, and inhibited the short-photoperiod related increase in LH receptor concentration. Prolactin receptor levels were not affected by pinealectomy. The present results indicate that both the increase and the decrease in pineal indoles can affect testicular hormone receptors. However, it appears that pineal indoles are not the only photoperiod-related regulators of testicular function. Supported by NIH grant HD20001.

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STATUS UPDATE ON KANKAKEE MALLOW IN ILLINOIS. W.D. Glass and J. Schwegman, Illinois Department of Conservation, Springfield, IL 62706. The Illinois endangered Kankakee Mallow (Iliamna remota) only occurs naturally on a small dolomite island in the Kankakee River. Langham Island is a dedicated Illinois Nature Preserve and is owned and managed by the Illinois Department of Conservation. The mature (flowering) plants have been steadily decreasing for the last four years. Threats to the population include woody plant encroachment, exotic species and deer browse. Management activities have included prescribed burning, chemical control of exotic species, deer control, monitoring permanent plots, propagation of seeds and seed protection by cold seed storage at the USDA. These management activities have been successful in increasing the population. Prescribed burning has been quite effective in stimulating seed germination and recruitment into the population. Although the flowering individuals have been declining the total number of plants has been increasing from 172 in 1985 to 509 in 1986.

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SUMMARIZING ILLINOIS ENDANGERED PLANT SPECIES INFORMATION WITH ILPIN AND RPC. L.R. Iverson, P. Burton, D. Ketzner, and K. Robertson, Section of Botany, Illinois Natural History Survey, Champaign, IL 61820. The Illinois Plant Information Network (ILPIN) and the Rare Plant Collection (RPC) data bases provide rapid means for summarizing the status of endangered species in the state. ILPIN has information on taxonomy, biology, ecology, and distribution on over 3100 species found in the state, and can be used to summarize characteristics of endangered species. RPC has herbarium label data for the T&E plant species including collection date, location, and habitat. The Illinois Geographic Information System (GIS) provides mapping capability which, when linked to the other data bases, can graphically portray species distribution and model potential species habitat. Capabilities are being explored which demonstrate the importance of biogeographic factors, substrate requirements, and land use changes, and to help evaluate habitat suitability models, conservation efforts, and attempts to locate new populations.

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LEAF ARCHITECTURE IN CULCASIA. L. A. Taylor and R. C. Keating, Southern Illinois University, Edwardsville, IL 62026. Traditionally, Culcasia has been classified in the Araceae as a member of Engler's subfamily Pothoideae. Recent suggestions have placed the genus in the subfamily Lasioideae. Using Hickey's classification system, we characterized the leaf architecture of Culcasia and its presumed relatives Gonatopus, Zamioculcas (Pothoideae) and Cercestis and Rhektophyllum (Lasioideae). Leaf forms of the samples vary between elliptical, auriculate, and hastate. But in all cases secondary veins are eucamptodromous or brochidodromous with irregular intercostal areas. Higher order venation produces very unpredictable domains. Culcasia leaf structure is compatible with that of Gonatopus and Zamioculcas but also very similar to that of Cercestis and Rhektophyllum. We suggest that all five genera should be classified together, probably in the Lasioideae.

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TESTING PLANTS FOR CYANIDE PRODUCTION. K.E. Aikman and D.L. Bergman, Eastern Illinois University, Charleston, IL 61920. The Feigl-Anger technique for determining cyanide production in plants will be demonstrated.

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FALLING SPRING--ACTIVE TUFA FORMATION IN SOUTHERN ILLINOIS. D.G. Rands, J.S. Davis, B.J. Keller and J. Lucero, Southern Illinois University at Edwardsville, Edwardsville, IL 62026 and University of Florida, Gainesville, FL 32611. Falling Spring, located near Dupo, Madison County, in southern Illinois, is an active tufa-former. A series of water analyses taken over a one-year period shows that the spring water is supersaturated with respect to calcite and atmospheric carbon dioxide. Scanning electron micrographs illustrate the crystallization of calcite on surfaces of the algae population of the tufa.

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DISSECTION OF ALLUVIAL DEPOSITS AFTER FAILURE OF THE LAKE CHARLESTON SPILLWAY. V.P. Gutowski and E. Mears, Eastern Illinois University, Charleston, IL 61920. After failure of the spillway at Lake Charleston, upstream migration of the headcut exhibited variations in direction and rate of movement. Rates of upstream movement varied from less than 20 feet per day to over 450 feet per day. Rates of movement did not correspond to rainfall/runoff events. Field mapping and sediment sampling showed that rate of movement and direction were related to lakebed topography, thalweg streamlines and composition of the pre-lake alluvial fill. Older, oxidized terrace soils proved more resistant to erosion than did younger, lower alluvial fill.

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IMMUNOHISTOCHEMICAL STUDY OF BOWEN'S DISEASE, BASAL CELL CARCINOMA, AND SQUAMOUS CELL CARCINOMA IN THE SKIN. A. Armin, R. Gradini, P.D. Toto, A.M. Eng, H. Nadimi, R. Martinez, Loyola University of Chicago, Maywood, IL 60153, In this study we utilized a peroxidase technique cn formalin-fixed, paraffin-embedded tissue, for detecting the site of binding of lectins (Concanavalin A, Ricinus Communis Agglutinin), and for detecting proteins (involucrin, S-100 protein, keratin, factor VIII-related antigen, beta 2-microglobulin, laminin, and fibronectin), in Bowen's disease, basal cell carcinoma, and squamous cell carcinoma of the skin. The purpose of this study is to detect the differences in the pattern of staining distribution, comparatively, for the three lesions. The results are summarized in Table 1.

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IMMUNOHISTOCHEMICAL STUDY OF NORMAL SKIN. A. Armin, R. Gradini, P.D. Toto, A.M. Eng, H. Nadimi, R. Martinez, Loyola University of Chicago, Maywood, IL 60153. In this study we analyze the distribution of lectin binding receptors in human skin, in an effort to identify lectins with potential application as cell markers. The binding properties of Con A and RCA-I were studied by using a peroxidase technique applicable to formalin-fixed, paraffin-embedded tissue. We also studied the distribution of several proteins (involucrin, S-100 protein, keratin, factor VIII-related antigen, actin, beta 2-microglobulin, laminin, and fibronectin), to evaluate the pattern of their localization in normal skin. Monoclonal antibodies and a peroxidase technique applicable to formalin-fixed, paraffin-embedded tissue were used. The results are summarized in Table 1.

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LIPID BIOSYNTHESIS IN ARRESTED PHASE DIPLOID CHICK FIBROBLASTS. J. D. Lane and P. J. Nielsen, Western Illinois University, Macomb, IL 61455. The serial distribution of various lipid subclasses in low-serum cultures (LSC) was investigated. At one week intervals LSC chick fibroblast cell lines were pulsed with ^{14}C Acetate. Lipid fractions were extracted and seperated using thin layer chromatography. The results indicate that the majority of radioacetate was incorporated into the phospholipid and fatty acid subclasses with no apparent temporal pattern but a marked reciprocal relationship. There was a sharp decrease in the radioacetate uptake following four weeks in LSC but an increase in the quantity of lipid. It was shown that a longer pulse time may have corrected for the low counts obtained in the other fractions.

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ISOLATION AND CHARACTERIZATION OF PLASMIDS FROM BACILLUS SUBTILIS (NATTO). K.A. Rennick, R.J. Bothast, and N.J. Alexander, Northern Regional Research Center, Agricultural Research Service, U.S. Department of Agriculture, 1815 N. University Street, Peoria, IL 61604. DNA was isolated from 15 Bacillus subtilis (natto) strains and examined for the presence of plasmids by agarose gel electrophoresis. Two distinct plasmid DNA patterns were observed: (1) strains containing at least three bands having molecular weights of 4.3, 3.8, and 2.1 X 10^6 daltons(d) with the 2.1 X 10^6 d band being the dominant form, and (2) strains yielding at least eight bands with molecular weights of 6.3, 4.0, 3.3, 2.7, 2.0, 1.8, 1.2, and 0.9 X 10^6 d with the 2.7, 2.0, 1.8, and 1.2 X 10^6 d bands being the dominant forms. Preliminary studies, in which southern hybridization was used, indicate that the plasmids in group (1) are unrelated to those in group (2).

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A SURVEY OF UNDERGRADUATE STUDENTS AT EASTERN ILLINOIS UNIVERSITY CONCERNING EVOLUTION AND CREATIONISM. T.M. Weidner, Eastern Illinois University, Charleston, IL 61920. In both 1982 and 1986, approximately 1000 Eastern Illinois University students completed an identical survey-questionnaire regarding their attitudes and knowledge about the origin of life, evolution, and creationism. There were few statistical differences between the 1982 and 1986 responses. Although 72% of the students agreed with basic evolutionary theory, about 40% also claimed belief in a recent creation of the world. A similar percentage (41%) of the respondents agreed with the statement that "evolution is an unproven theory." More than half the students (54%) believed that both the Biblical account of creation and the evolutionary account of creation should be taught in the public school science classroom. Students describing themselves as "religious" responded with answers usually described as conservative. As expected, science and non-science majors differed significantly in many responses.

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OSTEOLOGICAL DIFFERENCES DISTINGUISHING REDEAR SUNFISH, LEPOMIS MICROLOPHUS (GUNTHER) FROM OTHER LEPOMIS SPECIES. M.L. Colburn, Illinois State Museum Springfield, IL 62706. Cranial elements of modern redear sunfishes (Lepomis microlophus) were examined for characteristics that distinguish it from other species of sunfish (Lepomis spp.). Distinctive elements that were found include the lower and upper pharyngeal arches, the parasphenoid, the basioccipital, and the prootics. These characteristics and modern comparative skeletons were used to identify archaeological specimens from the fill of an Emergent Mississippian pit house at the Range site in St. Clair county, Illinois as being remains of redear. The finding of this species in an archaeological assemblage appears to be of some significance because the native distribution of the redear lies south of the Range site location and because some sources think that the redear was introduced to Illinois in the 1900's.

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MODERN ZOOS AND SPECIES CONSERVATION. D.M. Jedlicka, University of Illinois at Chicago, Chicago, IL 60680. Modern zoos are considered a haven for certain animal species. Some animal species are greatly affected by human interactions influencing the species' natural environment. Zoological gardens and aquariums may be a species last refuge OR a place to regroup for later release. The American Association of Zoos and Aquariums' Species Survival Plan is a plan to maintain the wild population characteristics within international captive populations.

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ASSESSING BALD EAGLE USE OF ARTIFICIAL PERCHES. Patti L. Malmborg and Glendy C. Vanderah. Illinois Natural History Survey, Champaign, IL 61820. In 1984 the Illinois Department of Transportation constructed a new four-lane bridge across the Mississippi River between Keokuk, Iowa and Hamilton, Illinois. Construction necessitated the removal of diurnal perch trees from a known bald eagle wintering area. To mitigate the impact of tree loss, artificial perch trees were erected downstream of the new bridge. In order to determine the usefulness of these perches to bald eagles, data on eagle activities were collected throughout the 1986 winter. Adult and immature eagles were observed using the artificial perches. Final comparisons will be made between bald eagle use of artificial versus natural perches. Possible preferences for specific artificial perch designs will also be assessed. Results from this study will provide information useful to future mitigation decisions and management of bald eagle wintering areas.

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A PRACTICAL APPROACH TO ENDANGERED PLANT CONSERVATION. J. E. Schwegman, Illinois Department of Conservation, Springfield, IL 62701-1787. Due to the large number of endangered vascular plants in Illinois, standard procedures for census and demographic monitoring have been developed and implemented by the Department of Conservation to guide management. The procedures utilize two standard permanent plots and involve recording data possibly relevant to population changes. The program is implemented by District Biologists and requires about 3 work days annually per species. Eighteen species, mostly plants under review for federal listing as endangered, were monitored in 1986.

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ILLINOIS ENDANGERED AND THREATENED PLANT SPECIES LIST UPDATE PROJECT, M.L. Bowles, The Morton Arboretun, Lisle, IL 60532. The Illinois Endangered Species Protection Act requires the Endangered Species Protection Board to provide an update of the Illinois endangered and threatened plant species list (initially established in 1980) at no less than 5-year intervals. By contract with the Board, the Morton Arboretum is providing this update through an herbarium search, literature review, and personal contact. New taxonomic or nomenclatural changes affect about 45 of these species and some now are known to be too common for listing. New Illinois plant records include about 50 species (among at least 25 families), which are being reviewed for listing. De-listing of species requires satisfactory scientific evidence and all status changes are made only after a public hearing.

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POPULATION STATUS, ECOLOGY, AND MANAGEMENT NEEDS OF THE HEART-LEAVED PLANTAIN (Plantago cordata Michx.) AT THE MACKINAW RIVER RECREATION AREA, TAZEWELL CO., IL. M.L. Bowles and S.I. Apfelbaum, The Morton Arboretum, Lisle, IL 60532. Factors affecting survival and decline of the state endangered Plantago cordata in adjacent ravines were investigated during 1986. This semi-aquatic plantain occupies stream gravel bars and is susceptible to siltation, erosion, and succession to riparian vegetation. Stream water and sediment quality were similar in adjacent ravine habitats. However, a larger watershed, and more upland area in agriculture appear to contribute more to stream erosion in one ravine. Since 1950, local rainstorm events have been most frequent and intense during 1981-1985. These stochastic events in combination with maintenance of uplands in agriculture may have lead to recent population decline in the ravine habitat with a larger watershed.

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BLACK-CROWNED NIGHT-HERON USE OF AN ARTIFICIAL NESTING STRUCTURE. S.M. Byers, S. Storlid, and G.V. Burger, Max McGraw Wildlife Foundation, Dundee, IL 60118. Declining numbers of the state endangered Black-crowned Night-Heron (BCNH) (Nycticorax nycticorax) at Baker's Lake, Barrington, IL appeared to be related to continued loss of suitable nesting substrate. Consequently, the senior author designed and helped erect an artificial nesting structure for BCNH. Nesting attempts on the structure were as follows: BCNH (25 nests), great blue herons (Ardea herodias) (11 nests), and great egrets (Casmerodius albus) (2 nests). All three species fledged young from the structure. The use of artificial nesting structures by BCNH has not previously been reported in the literature. The spatial and temporal use of the structure by the three heron species was similar to their use of nearby natural nesting substrate. A lower fledgling rate for BCNH nesting on the structure (1.63/nest) may have reflected generally later nesting attempts. The fledgling rate for BCNH in vegetation was 1.82/nest.

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BIOLOGY OF THE BLUEHEAD SHINER, NOTROPIS HUBBSI, AN ILLINOIS ENDANGERED SPECIES. B.M. Burr, R.C. Heidinger, and D.E. Fletcher, Southern Illinois University, Carbondale, IL 62901-6501. The bluehead shiner is one of Illinois' rarest fishes. It is restricted to the Wolf Lake-LaRue Pine Hills area in Union County. Chemical spills into Wolf Lake in 1974 and 1979 caused massive fish kills and the bluehead shiner has not been found in Illinois since 1974. In an effort to protect, manage, and possibly restock the bluehead shiner in Illinois, a study of its life history was initiated in May 1986. Stock was obtained from Louisiana and released into a 0.1-ha culture pond at SIUC. Spawning occurred in June and September. Females mature at 40 mm and 1 year of age; they produce between 337 and 510 mature ova. Individuals do not live beyond 2+ years. Food consists of small crustaceans and insects. Work continues on documentation of spawning behavior, egg deposition sites, larval development, and parasite infestations. Potential sites within the original range of the bluehead shiner are being identified for possible restocking.

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DISCOVERY OF INDIANA BAT (*MYOTIS SODALIS*) MATERNITY ROOST TREES IN WESTERN ILLINOIS. J. E. Gardner and J. E. Hofmann, Illinois Natural History Survey, Champaign, IL 61820, and J. D. Garner, Illinois Department of Conservation, Springfield, IL 62706. Female Indiana bats (*Myotis sodalis*) leave the hibernacula in early spring and establish maternity roosts beneath the loose bark of trees. Juvenile and reproductively active adult female Indiana bats from maternity colonies have been captured at many sites in several Illinois counties. However, the actual roost trees used by maternity bats have been extremely difficult to locate. Approximately 873 potential roost trees found in 28 Illinois counties were examined during the first two years of a five-year cooperative research project. As a result, two roost trees utilized by maternity Indiana bats were discovered in Pike County, Illinois during 1986. One tree was discovered through routine examination with a bat detector and the other through radiotelemetry.

-122-

PAST STUDIES OF THE RIVER OTTER (LUTRA CANADENSIS) IN ILLINOIS, E.A. Anderson, Illinois Department of Conservation, Alton, IL 62002. The river otter has been the subject of 3 recent studies in Illinois. From 1981-1982, a study was conducted to determine the current status and distribution of the river otter in Illinois. Results indicated a sporadic occurrence throughout much of Illinois, however, the major portion of the population exists along the Mississippi River and it's backwaters and tributaries in northwestern Illinois. From 1982-1983, a study was conducted to identify and characterize critical areas of otter habitat in this latter portion of their range. Monitoring of habitat and den selection by two otters through radio telemetry and that of other otters through field observations identified seasonally the type of areas used. Evaluation of habitats along that portion of the Mississippi River bordering Illinois resulted in identification of 13 areas of critical river otter habitat. In 1983, a study involved an effort to develop management plans for each of those 13 areas, including habitat manipulation and recommendations for modification of trapping regulations.

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CHICAGO PEREGRINE RELEASE: THE FIRST YEAR. M. Spreyer, Director of Chicago Peregrine Release. Arranging for and releasing five endangered peregrine falcons from a building in Chicago is not a simple process. Insights into peregrine politics, logistics, and biology will be presented. Video footage of the falcons' first tentative wing flaps will be shown.

-124-

HELMINTH PARASITES OF FISHES OF ILLINOIS AND ADJACENT STATES. Donal G. Myer, Southern Illinois University at Edwardsville 62026. Of 296 helminth taxa reported from fishes in Illinois and the adjacent states of Wisconsin, Michigan, Indiana, Kentucky, Missouri and Iowa, 96 have been reported from Illinois fishes. The 96 include 47 Monogenea (of 79 regional), 17 Digenea (95), 15 Cestoda (66), 8 Nematoda (32), and 9 Acanthocephala (24). Helminths have been reported from only 52 of 186 species of Illinois native fishes and 1 of 14 introduced species. No helminths have been reported from 12 now extirpated fish species or from the 12 species of fishes reported to be rare in Illinois (P. Smith, 1979, The Fishes of Illinois). In Illinois, a single helminth species has been reported for each of 22 species of Illinois fishes, 2 from each of 9 fish species, 3 from 9, 4 from 3, 5 from 2, 6 from 1, 7 from 3, and 8 from 2 fish species. Lepomis macrochirus (bluegill) has 17 helminth species reported from it, Lepomis cyanellus (green sunfish) 21 species.

-125-

HELMINTH PARASITES OF AMPHIBIANS FROM ILLINOIS AND ADJACENT MIDWESTERN STATES: A REVIEW. W.G. Dyer and P.R. Varble, Southern Illinois University, Carbondale, IL 62901. Few comprehensive surveys have been conducted on the helminths of amphibians from Illinois and adjacent midwestern states, namely, Wisconsin, Iowa, Missouri, Kentucky, Indiana and Michigan. The majority of reports are confined primarily to the helminths of anurans while little is known of salamander parasites. Nematodes and trematodes are probably the most common parasites, while the occurrence of tapeworms appears to be essentially correlated with an aquatic environment. Acanthocephalans are rare parasites of terrestrial salamanders. Although some species of helminths have been studied experimentally primarily in life cycle investigations, most information concerning the helminths of amphibians is of a descriptive nature, based on taxonomic surveys and morphological investigations.

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HELMINTH PARASITES OF ILLINOIS MAMMALS. H. Pigage and J. Pigage, Elmhurst College, Elmhurst, IL. Abstract not available at press time.

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PENTASTOMIDA OF THE ILLINOIS AREA: A REVIEW. G.S. Garoian, Southern Illinois University, Carbondale, IL 62901-6501. A review of the scientific literature of this small but distinctive phylum commonly called tongue worms will be given. There are only 90 species worldwide and most are parasites of the mouth and/or respiratory system of vertebrates, especially reptiles. Although known from a few Illinois and midwest vertebrates, apparently they are very rare, seldom looked for, or not reported in Illinois.

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THE BIVALVIA (MOLLUSCA) OF ILLINOIS. K. Cummings, Illinois Natural History Survey, Champaign, IL. Abstract not available at press time.

-129-

TERRESTRIAL GASTROPODS IN ILLINOIS. Dorothea S. Franzen, Illinois Wesleyan University, Bloomington, IL 61702. In Illinois fourteen families of terrestrial mollusks are represented. The habitats of the majority of species are wooded hillsides and lowlands; a few inhabit prairies and grasslands. Some species are geographically generally distributed, some are mostly in northern and some in southern parts of the state. Others are restricted to wooded areas in valleys, ravines and bluffs of the Wabash, Ohio and Mississippi rivers. Of the family Succineidae an extension of the previously known range of Oxyloma salleana (Pfeiffer) and two recently described species, Oxyloma deprimida Franzen and Catinella parallela Franzen will be reported.

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AS THE WORM TURNS: AQUATIC OLIGOCHAETA IN ILLINOIS. M.J. Wetzel, Section of Faunistic Surveys and Insect Identification, Illinois Natural History Survey, 607 E. Peabody Drive, Champaign, IL 61820. Oligochaeta represent one of the most diverse and abundant groups of benthic infauna in freshwater environments. While some species are widely distributed and tolerant of a moderate range of water quality, other species are more restricted in distribution and highly sensitive to environmental fluctuations. Currently, five families of Oligochaeta occurring in aquatic and semiaquatic habitats in North America contain 53 genera and 150 nominal species. Of these, four families, 36 genera, and 60 species currently are known to occur in Illinois waters, including the Ohio, Mississippi, and Wabash rivers, and Lake Michigan, all of which border Illinois. The phylogenetic relationships of aquatic Oligochaeta to other members of the phylum Annelida will be outlined. Methods for collecting, preservation, and identification of aquatic worms will be discussed and available in written form.

-131-

IN PURSUIT OF OPPORTUNITY: AQUATIC HIRUDINEA IN ILLINOIS. M.J. Wetzel, Section of Faunistic Surveys and Insect Identification, Illinois Natural History Survey, 607 E. Peabody Drive, Champaign, IL 61820. The Hirudinea, or leeches, are a predominantly freshwater group, although many marine and terrestrial species occur throughout the world. Currently, four orders, five families, 22 genera, and 63 nominal species of leeches are known to occur in North America. Of these, 3 orders, four families, 17 genera, and 32 species occur in Illinois. Although leeches are known to the layperson as "bloodsuckers", most species are predators and scavengers; only a few will take blood from warm-blooded animals. In the past, inadequate or improper treatment of the leeches in aquatic studies has been attributed to lack of a proper key to species, unfamiliarity with current literature, and difficulty in identifying improperly preserved material. The phylogenetic relationships of Hirudinea to other members of the phylum Annelida will be outlined. Methods for the collection, narcotization, preservation, and identification of leeches will be discussed and available in written form.

-132-

THE ANGLE ON THE ANGLE-WORMS OR EARTHWORMS (OLIGOCHAETA) OF THE MIDWEST. R.J. Wolff, Trinity Christian College, Palos Heights, IL 60403. Earthworms are important members of the soil fauna, having a strong influence on soil structure, metabolism and community ecology. The earthworm fauna of the midwest consists of over 30 reported species in three families. Over 20 of these are exotic species, primarily from Europe, and they seem to be supplanting the endemic fauna. This may be due to direct competition and/or greater pollution tolerance.

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THE SPONGES (PORIFERA) OF ILLINOIS. J.A. Beatty, Southern Illinois University, Carbondale, IL. Abstract not available at press time.

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THE GASTROTRICHA OF ILLINOIS. C.E. Robbins, Loyola University, Chicago, IL. Abstract not available at press time.

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THE ISOPODA OF ILLINOIS. J.A. Beatty, Southern Illinois University, Carbondale, IL. Abstract not available at press time.

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CENTIPEDES OF THE NORTH-CENTRAL REGION OF THE UNITED STATES. Gerald Summers, University of Missouri, Columbia MO 65211. The centipede fauna of Illinois is among the best-known in the United States. Systematics resources in Illinois include adequate coverage of most areas of the state and provide evidence of a richer fauna than is found in any adjacent state. Ecological factors affecting local distribution have been documented. Microhabitat segregation occurs among coexisting species and community diversity is associated with simple measures of habitat complexity. Population structure, microhabitat preferences, and limited vagility affect geographic distribution in centipedes and result in characteristic regional faunas which meet in Illinois.

-137-

THE ACARI - A QUICK FIX. R.C. Funk, Eastern Illinois University, Charleston, IL 61920. A summary of information on the Acari will be directed toward the nonacarologist. The presentation will include a discussion of methodology as well as the importance, structure and classification of the group.

-138-

BIOLOGY, STUDY AND ENJOYMENT OF GREAT LAKES HARVESTMEN (ARACHNIDA: OPILIONES). A.L. Edgar, Alma College, Alma, MI 48801. General remarks are made on the species of Order Opiliones found in the Great Lakes Region (Illinois, Indiana, Michigan, Ohio, Wisconsin and Ontario). The three suborders are characterized and major habitats depicted. A brief key to the species in Illinois is presented. Notes on collection and preservation, field observation, laboratory maintenance, status of research in North America at this time and topics of recent research are given. Techniques and instrumentation for field and laboratory studies are described. Mention is made of intriguing behaviors by harvestmen.

-139-

THE SPIDERS (ARACHNIDA: ARANEAE) OF ILLINOIS. J.A. Beatty and D. Mott, Southern Illinois University, Carbondale, IL. Abstract not available at press time.

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SPIDERS OF THE FAMILIES SALTICIDAE AND LYCOSIDAE (ARANEAE) FROM ILLINOIS AND THE MIDWEST. R.J. Wolff and B.L. Bootsma, Trinity Christian College, Palos Heights, IL 60463. The wolf spiders of the family Lycosidae and the jumping spiders of the family Salticidae are both major taxa of wandering or cursorial arachnids. The lycosids are primarily ground dwelling spiders and the fauna of Illinois and the midwest consists of over 50 species distributed among over 9 genera. The salticids are a very large family of spiders that wander over vegetation, and consist of at least 84 species in 32 genera. Both families have spiders that are primarily boreal with their southern distribution occurring in the midwest or are primarily widespread in the eastern U.S. and reach their northern limits in the upper midwest. Very few of these spiders are limited to prairie habitats finding their easternmost distribution in Illinois.

-141-

A PRELIMINARY CHECKLIST OF ILLINOIS ODONATA WITH A KEY TO GENERA. T.E. Vogt and E.D. Cashatt, Natural Land Institute, Rockford, IL 61108, and Illinois State Museum, Springfield, IL 62706. An annotated checklist and key to genera of adult dragonflies and damselflies are provided. The known Illinois fauna presently includes 10 families, 48 genera, and 139 species. Included are 5 new state records: Argia translata Hagen, Enallagma anna Williamson, Enallagma divagans Selys, Enallagma vernale Gloyd, and Nehalennia gracilis Morse. Twenty new records have been added to the state list since 1985. The possible endangered status of several species, including Stylurus notatus (Rambur), is discussed.

-142-

THE GRASSHOPPERS, KATYDIDS, AND WALKING STICKS (ORTHOPTERA: ACRIDIDAE, TETTIGONIIDAE, PHASMATIDAE) OF THE PRAIRIES AND SAVANNAS OF ILLINOIS. R. Panzer, Northeastern Illinois University, Chicago, IL 60625. This paper discusses the identification, distribution, habitat associations, and apparent status of the Orthoptera (in part) of the prairies and savannas of Illinois, with emphasis on the fauna of northeastern Illinois. Qualitative data obtained in surveys of natural area remnants in the Chicago region suggest that, while most grassland species are widespread and common as is generally reported, several are apparently very uncommon. This is due at least in part to the almost total destruction of the prairies and savannas of this region.

-143-

COLLECTION, IDENTIFICATION AND STUDY OF ILLINOIS PSOCOPTERA. G.E. Eertmoed and E.L. Mockford, Chicago State University, Chicago, IL 60628, and Illinois State University, Normal, IL 61761. Insects of the order Psocoptera are often the most locally abundant herbivores on surfaces of standing vegetation, within the forest litter, and on rock outcrops where supplies of algae and fungi are available for grazing. They can be collected by beating, sweeping, searching, or sifting and are easily preserved in 80% ethanol. We include an introduction to the psocid anatomy required to use the accompanying key to Illinois families and genera. A list of species known to occur or potentially occurring in Illinois is included.

-144-

THE HEMIPTERA OF ILLINOIS. J. E. McPherson, Southern Illinois University at Carbondale, Carbondale, IL 62901. The Hemiptera (or true bugs) is a large insect group that occurs worldwide. It is well represented in America north of Mexico by about 45 families, 36 of which occur in Illinois. Only a few of the Illinois taxa have been extensively investigated including the Pentatomoidea, Miridae, and aquatic bugs. Thus, the majority of the Illinois fauna is still poorly known. Studies of state distribution and biology are needed to help determine the current status of various taxa in the state and to provide information on the occurrence of these same taxa in North America.

-145-

THE WEEVILS (COLEOPTERA) OF ILLINOIS. R. Hamilton, Loyola University, Chicago, IL. Abstract not available at press time.

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THE FAMILY EROTYLIDAE (COLEOPTERA) IN ILLINOIS. M.A. Goodrich, Eastern Illinois University, Charleston, IL 61920, and P.E. Skelley, University of Florida, Gainesville, FL 32607. The family Erotylidae in Illinois includes 7 genera containing 23 species and 2 subspecies, as follows: Dacne (1 sp.); Megalodacne (2 spp.); Microsternus (1 sp.); Triplax (7 spp.); Ischyrus (1 sp.); Pseudischyrus (1 sp); and Tritoma (10 spp. and 1 sspp.). Three new records for Illinois are reported: Triplax festiva Lacordaire, 1842; Tritoma biguttata affinis Lacordaire, 1842 and Tritoma tenebrosa Fall, 1912. Four species here included in the Illinois fauna are provisionally listed, as no specimens from Illinois have yet been found, but specimens have been taken in neighboring states and their occurrence in Illinois is likely. Although biological data on many species is meagre, adults of all species are found in association with fungi.

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THE BUTTERFLIES (LEPIDOPTERA: HESPERIOIDEA AND PAPILIONOIDEA) OF THE PRAIRIES AND SAVANNAS OF ILLINOIS. R. Panzer, Northeastern Illinois University, Chicago, IL 60625. This paper examines the distribution, identification, habitat associations, and apparent status of the butterflies of the prairies and savannas of Illinois. Qualitative data obtained in surveys of natural area remnants in northeastern and westcentral Illinois suggest that many grassland species, restricted largely to small and widely scattered prairie and savanna 'islands', are presently very uncommon in Illinois. An examination of the the relationship between butterfly diversity and remnant size in the Chicago region suggests that these species may be expected to experience further declines in abundance as a consequence of their insularization.

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REVIEW OF THE MOTHS OF ILLINOIS WITH EMPHASIS ON THE BIOLOGY OF THE NOCTUIDAE AND NOTODONTIDAE. G. L. Godfrey, Section of Faunistic Surveys and Insect Identification, Illinois Natural History Survey, Champaign, IL 61820. An estimated 1,900 species of Lepidoptera occur in Illinois: about 150 butterflies, 1,000 micro- and 750 macro-moths. Among the approximately 50 Illinois species of Notodontidae and 450 Noctuidae that partially comprise the latter category are taxa with relatively specific host requirements. Knowledeg of their feeding strategies may aid in determining their susceptibility to endangerment and may help us select indicator species for monitoring environmental fitness.

-149-

AN INTRODUCTION TO THE COMMON FAMILIES OF ILLINOIS DIPTERA. D. Webb, Illinois Natural History Survey, Champaign, IL. Abstract not available at press time.

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THE ANTS (HYMENOPTERA: FORMICIDAE) OF ILLINOIS. U. Chapp, Cole-Parmer, Chicago, IL. Abstract not available at press time.

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SOLUBILITY PRODUCTS OF THE RARE EARTH PHOSPHATES. Stephen N. Brune and F. Henry Firsching, Southern Illinois University at Edwardsville, Edwardsville, IL 62026. The solubility and the solubility products of 15 rare earth phosphates will be determined at 25 $\pm$ 1°C. The rare earth phosphates were prepared by precipitation from homogeneous solution by urea hydrolysis. Activity products were calculated from the experimental data. Since the solubility of the rare earth phosphates is very low, the solubility product and the activity product are essentially the same. Preliminary results, using a molybdenum blue complex for the spectrophotometric determination of phosphorus, show that the solubility products of the rare earth phosphates is in the order of (K_{sp}=) 10^{-24} moles/liter.

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Junior Academy Representative: Donald R. Dickerson, Illinois State Geological Survey, 615 E. Peabody Dr., Champaign 61820. Office: 217/344-1481, X-291. (IJAS President: Rev. Bernard Horzen, St. Bede Academy, Peru 61354)

Editor (of Transactions): Anthony M. Garcy, Department of Biological Sciences, Chicago State University, Chicago 60628. Office: 312/995-2199; Home: 312/798-5016.

Museum Representative: Richard L. Leary, Illinois State Museum, Springfield 62706. Office: 217/782-6633

COUNCILORS-AT-LARGE

Term to Expire 1987

*C. Jack Bennett, Department of Biological Sciences, Northern Illinois University, DeKalb 60115-2861. Office: 815/753-7822.

*Laszlo Hanzely, Department of Biological Sciences. Northern Illinois University, DeKalb 60115. Office: 815/753-7815.

*H. John Sathoff, Department of Physics, Bradley University, Peoria 61625. Office: 309/677-3001.

*Alan M. Voelker, Department of Curriculum and Instruction, Northern Illinois University, DeKalb 60115. Office: 815/753-9258.

Term to Expire 1988

Dorothy R. Martin, Biology Department, Idaho State University, Pocatello, Idaho 83209.

Herbert L. Monoson, Department of Biology, Bradley University, Peoria 61625. Office: 309/677-3017.

Paul P. Sipiera, Department of Geology, William Rainey Harper College, Palatine 60067.

Term to Expire 1989

Amrik S. Dhaliwal, Department of Biology, Loyola University, Chicago 60626. Office: 312/508-3626.

Gary Kessler, Physics Department, Illinois Wesleyan University, Bloomington 61702. Office: 309/556-3004 or 3060

A. J. Mogenis, J.M. Huber Corp., P.O. Box 4005, Quincy 62305 Office: 217/224-1100.

DIVISION CHAIRS

*Agriculture: Teresa North, Department of Agriculture, Western Illinois University, Macomb 61455. Office: 309/298-1288.

*Anthropology and Archaeology: Bonnie W. Styles, Department of Anthropology, Illinois State Museum, Springfield 62706. Office: 217/782-6436

*Applied Science and Technology: Robert B. Rutledge, School of Engineering, Department of Electrical Engineering, Southern Illinois University, Edwardsville 62026. Office: 618/692-2500.

Botany: David S. Seigler, Department of Plant Sciences, University of Illinois, Urbana 61801. Office: 217/333-7577.

*Chemistry: Fred W. Breitbeill III, Department of Chemistry, DePaul University, 1036 W. Belden Ave., Chicago 60614. Office: 312/341-8187; Home: 312/394-1614.

*Collegiate Chemistry: Kurt W. Field, Department of Chemistry, Bradley University, Peoria 61625. Office: 309/676-7611, X-484.

Computer Science: Charles E. Neblock, Department of Computer Science, Western Illinois University, Macomb 61455. Office: 309/298-1452.

*Environmental Science: Gerald R. Gaffney, Department of Forestry, Southern Illinois University, Carbondale 62901. Office: 618/453-3341.

*Earth Science: Peter Calengas, Department of Geology, Western Illinois University, Macomb 61455. Office: 309/298-1256.

*Mathematics: William Bennewitz, Department of Mathematics and Statistics, Southern Illinois University, Edwardsville 62026.

Medical Science: Carol B. Lewandowski, University of Illinois at Chicago, PCRPS - Rm. 310, P.O. Box 6998, Chicago 60680. Office: 312/996-5926.

*Microbiology: Amrik S. Dhaliwal, Department of Biology, Loyola University, Chicago 60626. Office: 312/508-3626.

*Physics and Astronomy: H. John Sathoff, Department of Physics, Bradley University, Peoria 61625. Office: 309/676-7611, X-487.

*Science, Mathematics, and Technology Education: Alan M. Voelker, Department of Curriculum and Instruction, Northern Illinois University, DeKalb 60115. Office: 815/753-9258.

*Zoology: Robert J. Wolff, Biology Department, Trinity Christian College, 6601 W. College Dr., Palos Heights 60463. Office: 312/597-3000.

CHAIRS OF STANDING COMMITTEES

#Budget: Gary Kessler, Department of Physics, Illinois Wesleyan University, Bloomington 61702. Office: 309/556-3004 or 3060.

#Constitution and Bylaws: Marcia A. Miller, Department of Basic Sciences, Peoria School of Medicine, P.O. Box 1649, Peoria 61656. Office: 309/671-3124; Home: 309/965-2180.

#Fellows and Honorary Members: Donal G. Myer, School of Sciences, Southern Illinois University, Edwardsville 62026. Office: 618/692-3170.

#Meetings and Expositions: Laszlo Hanzely, Department of Biological Sciences, Northern Illinois University, DeKalb 60115. Office: 815/753-7815.

#Membership (co-chairs): Amrik S. Dhaliwal, Department of Biology, Loyola University, Chicago 60626. Office: 312/508-3626. and H. John Sathoff, Department of Physics, Bradley University, Peoria 61625. Office: 309/677-3001.

#Nominations and Elections: Harold M. Kaplan, 106 N. Almond St., Carbondale 62901. (School of Medicine, Southern Illinois University at Carbondale.) Office: 618/536-5513; Home: 618/457-2707.

#Publications: Richard L. Leary, Illinois State Museum, Springfield 62706. Office: 217/782-6633.

#Research Grants: Richard B. Brugam, Department of Biological Sciences, Box 1652, Southern Illinois University, Edwardsville 62026. Office: 618/692-2377 or 3927.

#Resolutions: C. Jack Bennett, Department of Biological Sciences, Northern Illinois University, DeKalb 60115-2861. Office: 815/753-7822.

#Science Talent Search (co-chairs): Donald R. Dickerson, Illinois State Geological Survey, 615 E. Peabody Dr., Champaign 61820. Office: 217/344-1481, X-291.
Dorothy R. Martin, 3431 60th St., Moline 61265. (Department of Biological Sciences, Black Hawk College.) Home: 309/762-1073.

#Science Education: Alan M. Voelker, Department of Curriculum and Instruction, Northern Illinois University, DeKalb 60115. Office: 815/753-9258.

OTHER OFFICIALS

AAAS and NAAS Delegate (1983-1986): Robert C. Duty, Department of Chemistry, Illinois State University, Normal 61761. Office: 309/438-2697.

#Delegate to Junior Academy: Donald R. Dickerson, Illinois State Geological Survey, 615 E. Peabody Dr., Champaign 61820. Office: 217/344-1481, X-291.

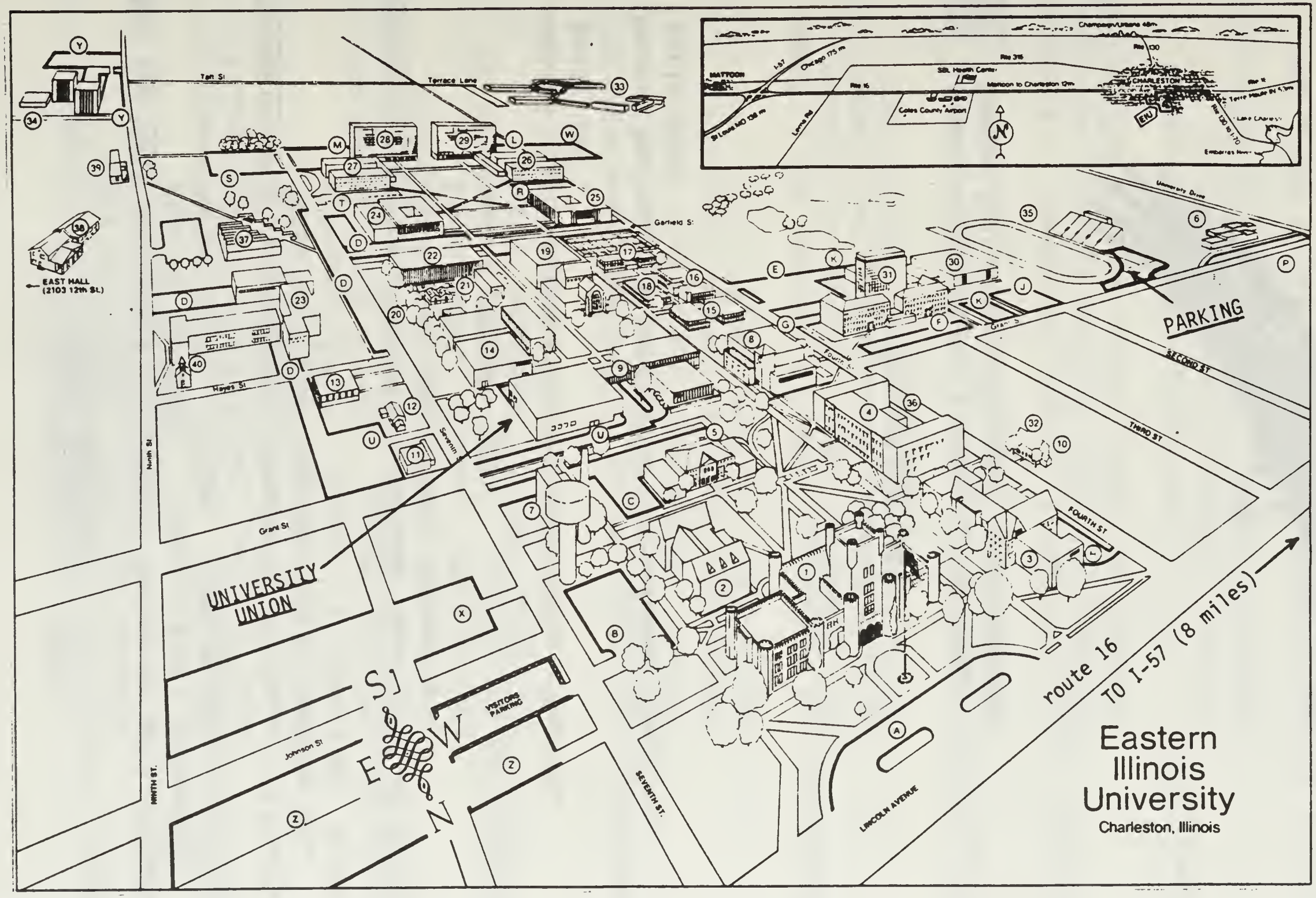
#Newsletter Editor: Roberta M. Meehan, Department of Biology, Idaho State University, Pocatello, Idaho 83209. Office: 208/236-3765; Home: 208/237-7532.

* Denotes position to be filled by election effective April 1987.

# Denotes position to be filled by President effective April 1987.

FUTURE MEETINGS

1988: Bradley University, Peoria, 21-22 October
1989: Loyola University, Chicago, 20-21 October



1. Old Main -- Admissions (Livingston C. Lord Administration Building)
2. Blair Hall
3. Pemberton Hall
4. Science Building
5. Student Services Building
6. Physical Plant Services Building
7. Power Plant
8. McAfee Gymnasium
9. University Union Martin Luther King, Jr.
10. Booth House (Personnel Offices)
11. Telephone and Security Building
12. Buzzard House
13. Clinical Services Building
14. Doudna Fine Arts Center
15. Ford Hall
16. McKinney Hall
17. Weller Hall
18. Gregg Triad
19. Booth Library
20. Life Science Vivarium
21. Greenhouse
22. Life Science Building
23. Buzzard Education Building
24. Applied Arts - Education Center
25. Coleman Hall
26. Taylor Hall
27. Thomas Hall
28. Andrews Hall
29. Lawson Hall
30. Lantz Health, Physical Education and Recreation Building
31. Lincoln-Douglas-Stevenson Halls
32. Non-Academic Personnel
33. University Apartments
34. Carman Hall
35. Stadium-Track (O'Brien Field)
36. Phipps Lecture Hall
37. Tarble Arts Center
38. East Hall (2103 12th St.)
39. Ninth Street Residence Hall
40. Greenwood School

New York Botanical Garden Library
3 5185 00342 5509